LIVING IN TWO WORLDS: A CRITICAL ETHNOGRAPHY OF ACADEMIC AND PROTO-PROFESSIONAL INTERACTIONS IN A HUMAN-COMPUTER INTERACTION DESIGN STUDIO

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This dissertation is dedicated to Jenni Gray Matlock, Austin Toombs, and Crystal Marquardt, who have unconditionally supported me throughout this educational journey.

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Studio pedagogy has been used broadly in traditional design disciplines for over a century, functioning as a signature pedagogy. This pedagogical approach is increasingly being adopted in non-traditional design disciplines, often without an understanding of why this pedagogy is effective from an instructional design perspective, or how its theoretical structures may function in disciplines outside of the design tradition. In this dissertation, I investigated a Master's program at a large Midwestern university in human-computer interaction (HCI), one of these emergent design disciplines, capturing the occurrence and underlying structures of communication as they emerged in informal dimensions of the pedagogy as experienced and enacted by students.

To produce a critical ethnography of this site, I collected data as a participant observer for two academic semesters, compiling over 450 contact hours, thousands of photographs, hundreds of hours of audio, and 30 critical interviews that were semi-structured, focused on specific topic domains. Almost two-thirds of the contact hours were located in a non-classroom studio space, where I interacted with students as they worked and socialized. The remaining contact hours were spent in classroom observations during the second semester of data collection, in order to compare and enrich my understanding of the student experience of the formal pedagogy.

Through an analysis of the structures of informal communication between students, I identified system relations that allowed for the constitution of student-led interactions in the studio space and encouraged reproduction of these interactions. Beneath these system relations, I discovered that students worked within two different fields of action: one oriented towards the academic community and related typificiations of classroom and professor behavior; and a second oriented towards the professional community. The structure-system relations led by students took

place within the proto-professional field, indicating a relationship with the professional community, even while the pedagogy placed students in the student role.

Implications of this relationship between students and the professional and academic communities are explored through the lenses of studio education in HCI and instructional design, indicating a need for more research on adaptation of the studio model in new disciplines, and the evolving identity of students in relation to the professional practice of design.

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CHAPTER 1: INTRODUCTION

Studio pedagogy has been used broadly in traditional design education for the past century (Cuff, 1991; Schön, 1985; Shulman, 2005) to train professionals in a range of design disciplines. Shulman (2005) refers to this mode of teaching and learning as a "signature pedagogy"—one signature pedagogy among many in higher education, such as law, music, and medicine—each of which describes a holistic understanding of early preparation, capstone or other proofs of competency, and sets of instructional strategies. In the studio signature pedagogy (hereafter, studio pedagogy), the practice of critique is central as a means of simultaneously communicating about and evaluating design processes and artifacts (Brown, 2002; Cennamo & Brandt, 2012; Hokanson, 2012; Oh, Ishizaki, Gross, & Do, 2012).

Classroom or professor-led conversation (Schön, 1983) has heretofore dominated the design pedagogy literature (Crysler, 1995), and in this study I highlight the broad and varied interactions occurring in informal contexts in relation to the formal pedagogy, privileging student voices over professor's voices or more formal elements of the educational system. In a formal sense, studio pedagogy has been used as a comprehensive system of acculturation (Brown, 2002) oriented towards the training of professionals, with the intention of preparing students to practice within their chosen discipline of design. This signature pedagogy is increasingly being adopted in a range of non-traditional design disciplines (Blevis, Rogers, Siegel, Hazlewood, & Stephano, 2004; Boling & Smith, 2010; Brandt et al., 2013; Cennamo et al., 2011; Reimer & Douglas, 2003), often with little understanding of the underlying theoretical structures of what makes the signature pedagogy of the studio effective or cohesive (Cennamo & Brandt, 2012; Shaffer, 2003). I use structures in a specialized way both here and throughout the dissertation, based on the work of Giddens (1979) and Carspecken (1996), where structures are differentiated from the system. In this understanding of structure and system, the system is that entity which allows for the coordination and reproduction of actions, and is constituted, in part, through communicative structures. The

structures are claimed through communicative acts, and represent the illocutionary infrastructure that reproduces the system over time.

An understanding of the theoretical structures of the studio is critical to an effective transformation or evolution of this signature pedagogy from traditional design disciplines—with an implicit historical understanding of the function of the studio—to disciplines without this cultural and historical knowledge. The formal elements of the design studio experience have been under-theorized and under-studied, but even less is known about the informal portions of the pedagogy in either traditional or non-traditional design disciplines, including the relationship of students to the formal pedagogical experience, and the roles they take on in the acculturation process within disciplines oriented towards professional practice.

In this dissertation study, I targeted an intersection of these two concerns—the transformation of the studio pedagogy into a non-traditional design discipline, and an understanding of the informal dimensions of the studio. To do this, I investigated the occurrence and underlying structures of communication—including critique as one structure of designerly communication—as they occur in informal portions of the design pedagogy as experienced and enacted by students. To do this, I created a descriptive record of informal designerly talk between students as one expression of the externalized or enacted "hidden curriculum" (Dutton, 1991) of a graduate design program. I then used this descriptive record to understand how students related to both the formal curriculum and their future community of professional practice.

Purpose of the Research

This study addresses a gap which appeared when I synthesized three strands of research. These three strands are: 1) the rapid adoption of studio pedagogy in non-design or emerging design spaces with little understanding of how this adoption and translation is taking place; 2) interactions that occur in the studio, including patterns of discourse and the underlying structures of interaction; and 3) the hidden curriculum of the studio as addressed from a critical perspective,

acknowledging that any view of a pedagogy is inherently shaped by the perspective or standpoint that is taken. These three strands, when taken together, represent a substantial gap in our understanding of studio as a pedagogy—including the underlying structures of studio education—and, more broadly, how students relate to a formal pedagogical experience.

Adoption of Studio Pedagogy

Studio pedagogy has been adopted in a variety of non-traditional design fields, such as: instructional design (Boling & Smith, 2010; Clinton & Rieber, 2010), computer science (Cennamo et al., 2011; Greenberg, 2009), engineering (Kuhn, 2001), and human-computer interaction (Blevis, Lim, Stolterman, Wolf, & Sato, 2007; Blevis et al., 2004). Despite adoption of the studio pedagogy in a range of non-traditional disciplines, this model of education has not been thoroughly analyzed or theorized in a transdisciplinary or disciplinary-specific way, especially in how the content or subject matter being taught is linked to the creation of appropriate supporting structures in the studio (Brandt et al., 2013). Research from an instructional design perspective has not adequately addressed studio pedagogy, either in traditional design disciplines, or in non-traditional design fields. The majority of ID research in this framing addresses the implementation of studio or studio-like pedagogy in teaching instructional design (Boling & Smith, 2010, 2014; Ertmer & Cennamo, 1995; Clinton & Rieber, 2010), but does not generally reach beyond this limited context to a larger understanding of the functioning of this signature pedagogy.

Interaction in the Studio

Critique is central to studio pedagogy (Cennamo & Brandt, 2012; Hokanson, 2012; Klebesadel & Kornetsky, 2009; Shulman, 2005), both as a way of evaluating designed artifacts (Parnell, Sara, Doidge, & Parsons, 2012), and as a way of talking like a designer (Gayol, 1994; Morton & O'Brien, 2006). Because of the ubiquity of critique in studio pedagogy, it has taken on numerous meanings in various contexts, used to describe evaluation from an individual one-on-one conversation (Schön, 1985) to a judgment by a formal jury (Anthony, 1991). This term has also

been used in a less formal way to describe the professional communication of a designer (Morton & O'Brien, 2006) in more informal portions of the pedagogy (e.g., studio communication, meetings with stakeholders). Virtually all of the kinds of "talk" or interaction currently studied in a studio context reference this loose construct of *critique*, in all of its formal and informal implementations, often without distinguishing the context of use, or whether it is situated as a means of educational evaluation or professional communication. In chapter three, I will demonstrate this historical trend in the academic literature, where critique is treated or assumed as a social and communicative construction, but has only been substantively studied in an evaluative, classroom-centric mode (Blythman, Orr, & Blair, 2007; Oh, Ishizaki, Gross, & Do, 2012). This reveals a substantial gap in the literature surrounding one of the key pedagogical elements of this signature pedagogy; we need to not only understand critique and other forms of interaction in the studio mandated by the pedagogy, but also how students enact critique and other kinds of talk outside of the formal pedagogy. This is important because, as Morton and O'Brien (2006) observe, the ultimate test of a design professional is not primarily evaluation in formal educational contexts, but rather the ability to "sell the design" to a variety of stakeholders in a professional setting.

Hidden Curriculum and a Critical Perspective

Initial attempts to theorize the underlying structures of the studio (Shaffer, 2003; Brandt et al., 2013) have demonstrated, in a limited way, how surface, pedagogical, and epistemological structures within a specific studio environment might be identified. The third, and deepest structural level of the studio—epistemological structures—are posited to underlie the entire educational endeavor, with structures that include: basic assumptions about the roles of students and professors, the nature of knowledge in the field of study, and the types of social interactions and skills that are perceived to be valuable (Shaffer, 2003). A fuller investigation of these epistemological structures invites attention to tacit structures of the pedagogy (Shulman, 2005), or what Dutton (1991) links to the unplanned or "hidden curriculum." Dutton (1991) posits that this

"hidden curriculum" is focused on "questions concerning the ideology of knowledge, and the social practices which structure the experiences of teachers and students" (p. 167), which can be seen as a natural extension of the Brandt et al. (2013) theorization of the studio environment. To fully investigate the epistemological layer, uncovering the structures that account for social practices and the experiential dimension of the pedagogy, I take a critical perspective, which is described in the next section.

Theory Informing This Study

To take on this critical perspective, I draw on several theoretical constructs, which serve as meta-theory for this study—in research design, data collection, and analysis. The primary theory I rely on is Carspecken's (1996) rendering of critical ethnography, which draws heavily on the work of Habermas (1984, 1987), Giddens (1979), and Brandom (1998). This critical perspective allows me to make sense of communicative acts beyond observation of individual phenomena, to reach a broader understanding of what structures and system features underlie these acts. Because I focus my attention on design pedagogy, I also draw on recent attempts to build theory about studio pedagogy (Brandt et al., 2013; Shaffer, 2003), including how the academic studio relates to future professional practice. These theories—Shaffer (2003) addressing the studio as a structural entity, and Brandt et al. (2013) describing the relationship of the studio to academic and professional communities of practice—relate to the purpose of the design studio environment, and provide a nuanced vocabulary regarding the relationship of elements in the studio to future professional practice. Finally, I use Dreyfus' (1981) generic model of expertise in a design context, as extended by Lawson and Dorst (2009) and Siegel and Stolterman (2008) to frame how meaning-making is constrained by an individual student's level of expertise, and how this relates methodologically to the underlying rationality of reflective conversation and other common design acts. Each of these theoretical constructs will be more fully explained in chapter three.

Guiding Questions

I draw on these theoretical constructs in order to focus on social structures—in particular, structures of informal communication—and relationships that emerge between students in the design studio, and how these structures relate to existing understandings of communication, critique, and emergent enactment of designerly talk. I investigated these structures by studying the informal environments of the studio and the socialization that occurs in primarily student-to-student interactions. To develop a fuller understanding of how these interactions related to the formal pedagogy, I also compared interactions between students in informal environments of the studio to the formal or "planned" classroom experience.

The discipline of Human-Computer Interaction (HCI), the context of this study, is currently moving from a legacy dominated by cognitive science in its "first wave" to one characterized by a "turn to design" (Cockton, 2008; Fallman, 2003) in its "third wave," and is typical of many disciplines that are implementing this new form of pedagogy[1]. Implementation of the studio pedagogy has been one outgrowth of these Kuhnian paradigm shifts in the HCI community, and the use of studio as a teaching tool is not yet mainstream, with many programs only transitioning to this mode in the last decade (Blevis et al., 2004), even though it has been called for since the early 1990s (Winograd, 1990); many more programs remain more closely tied with the first or second wave, where design is not central to the discipline, and have not taken on a studio approach. Within this complex and rapidly evolving disciplinary context, this critical ethnography addresses the underlying structures of communication—including the occurrence of designerly talk and the social structures and relationships to which this talk relates—in the informal portions of a design-focused HCI program (hereafter, HCI/d).

[1] HCI's "second wave" was focused on collaborative work in groups, as opposed to the individualistic assumption of the first wave. The context was related strongly to formal work settings and "interaction within well-established communities of practice" (Bødker, 2006, p. 1).

The study focuses on the following framing research questions, which evolved from a broader set of questions in the initial study design, and were refined and focused based on data collection and analysis activities.

1. What kinds of informal interactions are occurring outside of the formal pedagogy between students (primarily in the physical studio space)?
2. How do these informal interactions outside of the formal pedagogy relate to existing knowledge about critique as a signature type of studio interaction?
3. What structures exist and are propagated by students, and how do these structures relate to the assumed structures of the formal pedagogy?

I answer these questions through sustained ethnographic participant observations, interviews, and artifact analyses in a non-classroom HCI/d graduate studio and through observations of courses taught in this HCI/d program.

Contribution to the Field

The study has produced a descriptive and analytic record of interactions between students in the studio environment, with two primary outcomes that contribute to instructional design and the broader design community.

The first outcome of this study is descriptive, documenting the interactions between students that occur in the studio environment and providing a rich record of how students communicate about design outside of the classroom. This descriptive account is relatively low-inference, and serves as a basis on which to build a more integrated accounting for why things occurred in the way they did in an analytic framing. A descriptive accounting of this pedagogical experience expands the understanding of the instructional design community about how students relate to a complex pedagogical intervention in the context of studio pedagogy, including how they communicate and interact in non-classroom spaces that are meant to further their overall knowledge and practice of design. The larger design community also benefits from this exploration

of student interactions, as many understandings of studio culture are still highly individualistic in orientation, and do not account for or include documentation of the social milieu of the studio, or educative encounters that are not organized or led by academics.

The second outcome of this study is analytic in nature, addressing how this descriptive accounting of the pedagogical experience can be explained in relation to pedagogical structures and the larger educational system, including the relationship of interactions to formal critique, pedagogical structures of the studio, and the formal curriculum of this program. From an instructional design perspective, this outcome focuses attention on how students are active constructors of their own experience in relation to a designed pedagogy, and how various elements of the studio and formal pedagogy affect or shape student interactions. In the broader design community, this outcome expands our collective understanding of critique—from current scholarship focused almost solely on classroom critique—to account for communication between design students in informal settings, including the structures that account for this form of talk, and how structures responsible for interaction in non-classroom settings relate to the structures assumed by the formal pedagogy.

These descriptive and analytic outcomes foreground the role of the student in a non-traditional studio environment, and provide the research community with rich and deep examples of how students construct their own knowledge in this environment. In this framing, the students are represented as taking on personal and communal accountability for their future professional success through academic and proto-professional roles—representing the "two worlds" that students interact within through the formal and informal pedagogy. This study reshapes our view of what studio pedagogy can be, and how it has been applied in a specific non-traditional design context. Through this narrative account and related analysis, I reveal multiple areas of system-level complexity that simultaneously expand our understanding of how this pedagogy might be

extended and applied in various contexts in the future, while highlighting core elements of the studio pedagogy that have been retained from traditional design disciplines.

CHAPTER 2: REVIEW OF LITERATURE

The studio model of education commonly found in traditional design disciplines (Klebesadel & Kornetsky, 2009; Shulman, 2005) has been adopted and adapted in a number of non-traditional design disciplines in recent decades (Boling & Smith, 2010; Cennamo et al., 2011; Clinton & Rieber, 2010; Kuhn, 2001; Reimer & Douglas, 2003). This adoption of studio pedagogy as a model for educational practice has often been undertaken in non-traditional design disciplines without a full understanding of how the pedagogy functioned in relation to a specific subject matter prior to importation (Boling & Smith, 2010; Brown, 2002), and many of these traditional disciplines have not undergone a process of careful analysis of their own pedagogy (Crysler, 1995; Dutton, 1991). This lack of critical analysis is compounded, as non-traditional disciplines have frequently translated the studio pedagogy to new disciplines without an understanding of the full spectrum of cultural assumptions and practices that traditional fields employ in their approach to studio education.

There are several major concepts that will be important to consider in the context of this proposed study, including: an overview of studio education and the domains in which this pedagogy is currently utilized, the current state of critical pedagogy as a perspective within design education, and how critique is used within a studio pedagogy. Each of these concepts will be discussed in turn.

Studio Education

Brief History of Traditional Studio Education

Studio education was first adopted in the École des Beaux-Arts in France during the early 19th century, drawing on the successes of the apprenticeship system, but in a higher-volume, industrialized pedagogy that assigned numerous students to an *atelier* (Cret, 1941). Multiple students were assigned to a professional designer or artist, who was responsible for the students' progression throughout their course of study. Each professional brought a unique approach to their discipline, including pedagogical progression, methods of evaluation and critique, and a deciding

role on design juries to evaluate student work through competitions and other school-wide evaluations of work. This model was used for fine art and professional artistic disciplines (e.g., architectural design), and allowed *ateliers* or professors to guide their students through the professional training process, drawing on the success of the master-apprentice relationship, but in a newly formed one-to-many relationship. Early architecture schools in the United States adopted this model of instruction based on influences from the École des Beaux-Arts as part of the professionalization of the discipline (Cuff, 1991; Kuhn, 2001). The *atelier* model was adapted and refined in the implementation of studio in the German Bauhaus school in the early 20th century, with an increased focus on the development of a core curriculum and way of teaching design, reducing the reliance on a pure *atelier* model of instruction (Salama & Wilkinson, 2007). These divergent implementations of studio education merged in various ways in the United States following the dissolution of the Bauhaus school in the wake of World War II, with a continuation of these studio models at various art and design schools. While each model of studio pedagogy has a distinctive approach to the training of a designer or artist, they share a similar master/apprentice model of instruction with relatively low student/teacher ratios (Salama & Wilkinson, 2007).

Much of what is known about the studio, and by extension, the studio pedagogy, has been studied within the framing of specific design disciplines. For instance, research on the studio in architecture—the design discipline with perhaps the longest history in studio pedagogy—has often resulted in the building knowledge only within the confines of architecture, with specialized journals and conferences forming a largely insular, discipline specific collection of knowledge. This framing of research on studio pedagogy by discipline has created a siloing of information, which results in literature that often constrains knowledge of studio pedagogy by discipline, making it more difficult to address distinctive features of evaluation or student work and theorization of design activity in the studio across design disciplines. Unlike many other established content areas that enjoy curricular integration from P-12 to higher education levels (e.g., mathematics, literacy,

social studies) and have been traditionally studied from a distinctively educational standpoint, design pedagogy has been substantially more fragmented. Design pedagogy has not historically been studied in schools of education, is infrequently addressed or integrated into the P-12 educational system in the United States, and most research has occurred within disciplinary publishing boundaries. Only in the past two decades have organizations such as the Design Research Society (DRS) and Cumulus made sustained attempts to bridge educational research across multiple design disciplines (e.g., the first conference on design education by DRS and Cumulus in 2011). This siloing has led to a neglect of key structural features of the studio (Shaffer, 2003) of the studio in a transdisciplinary sense, with little sense of how these features may contribute to the effectiveness and functioning of a studio pedagogy across multiple design disciplines. Non-traditional design disciplines have suffered on account of this lack of cohesive scholarship, often basing their translation of studio pedagogy on the surface and pedagogical features of specific design disciplines (Blevis et al., 2004; Reimer & Douglas, 2003) in the absence of broad theoretical understanding of studio pedagogy across multiple design disciplines. For Blevis et al. (2004), this resulted in an HCI curriculum that was informed by the physical features of the fine art studio, including gallery spaces, darkrooms, and other physical spaces. Similarly, Reimer and Douglas (2003) drew explicitly from the physical features of the architectural program on their campus when forming physical spaces for their HCI studio.

Integration into Non-Traditional Disciplines

In the past two decades, studio pedagogy has been integrated into a wide range of non-traditional design disciplines such as computer science (Cennamo et al., 2011), engineering design (Kuhn, 2001), instructional design (Boling & Smith, 2010; Clinton & Rieber, 2010), and human-computer interaction design (Blevis et al., 2004; Kuutti, 2009; Reimer & Douglas, 2003). This implementation of studio pedagogy in non-traditional fields has often occurred with little critical attention, and implementers often basing their studio model after a single traditional design

discipline or school of design (Blevis et al., 2007; Cennamo, Brandt, & Scott, 2010; Reimer & Douglas, 2003) rather than a holistic understanding of studio pedagogy.

A substantial epistemological shift—an understanding of what counts as knowledge and how this knowledge is constructed—seems to occur in a number of fields, either concurrent with or shortly before the introduction of studio pedagogy, often surrounding conceptions of design. What this indicates is that the epistemological understanding of a discipline, including what kind of knowledge scholars in that discipline value and are able to build, has an effect on how the community proposes to educate students within that discipline. Across a range of disciplines, this relationship between theoretical and conceptual understandings of design and the related impact on pedagogy has played out in a variety of different ways, which I will demonstrate next. Smith and Boling (2009) brought this heightened awareness of design as a concept to instructional design, while Faiola (2007), Fallman (2003), and Kuutti (2009) offered this perspective in the field of HCI. For Smith and Boling (2009), a shift in the way the instructional design field viewed design—from an impoverished view that sees design as the selection of what model to use to design as a distinct tradition and way of knowing (Nelson & Stolterman, 2012)—informed their call for thinking about design and design education in a more expansive way, including a focus on the role of the designer and professional judgment. In the HCI community, this "turn to design" resulted in a rethinking of the core concepts of the field, including a shift from usability-centric models of practice (Kuutti, 2009) to understandings of meaningfulness and economy. In searching for a basis on which better theory could be built, researchers in this community turned outward, using the language of design to critique longstanding assumptions. This implied changes in the way education took place in HCI, with Blevis (2004) arguing for studio education to transmit this more complex understanding of the role of the designer. Faiola (2007) followed a similar path, proposing the Design Enterprise Model (DEM) to restructure HCI education in parallel with the discipline's overall turn to design; this model included knowledge domains a student should learn within, including social, design, business, and

computing; within these knowledge domains, the students should also be able to apply that knowledge across theory, application, and management operations. Even in traditional design disciplines, the conversation regarding the epistemological implications of design is ongoing, with Danvers (2003) and Jackson (1999) noting the role of pedagogy as an ontology of design in studio art education, where critical theory and emerging technological approaches are changing the very nature of what is created and how it is interpreted.

Theories of Studio Pedagogy

While studio pedagogy has been widely implemented in traditional design disciplines for over a century, no significant theories about this form of pedagogy have arisen that move beyond a specific design discipline to form a more encompassing explanation of what studio *is* as a distinctive pedagogy, particularly in an interdisciplinary sense. With the adoption of studio pedagogy in non-traditional design fields, several efforts have been made to theorize studio pedagogy in a broader way. Shulman (2005) attempts to condense the critical features of all signature pedagogies, establishing a theory of three structures that comprise the pedagogy: 1) surface structures, which are concrete educational acts; 2) deep structures, referring to the pedagogical assumptions that are used in conveying surface information; and 3) implicit structures, which define a moral dimension that includes attitudes, beliefs, and values (Shulman, 2005). Shaffer (2003) created a model with significant overlap in the context of an architectural design studio, also proposing three structures that define a studio form of education: 1) surface structures, comprising materials, resources, time and space available to students and faculty; 2) pedagogy, including the activities and forms of evaluation in the curriculum; and 3) epistemology, which describes the beliefs that underlies action in the studio. I will use the Shaffer (2003) model and its related structures henceforth, as it more accurately captures the unique elements present in a studio pedagogy, and results in less confusion about the location of meaning-making and normative structures, which are somewhat blended in Shulman's rendering of implicit and deep structures. For Shulman (2005), structures exist at various

levels of accessibility, with surface structures easily accessible and documentable, while deep and implicit structures that are more implicit or tacit are split into pedagogical and moral categories. Within the framing of critical research, all structures have a moral or normative component, and thus, the language of Shulman could result in an impoverished view of deep structures as being value-free if discussed separately from their corollary implicit structures.

Brandt et al. (2013) extend the work of Shaffer (2003) in the context of HCI and Industrial Design studios, positing that the surface features and pedagogy of a studio allows for the construction of a *studio bridge* (p. 345) between academic preparation and professional practice. Cennamo and Brandt (2012) continue this line of inquiry, addressing the social practices embedded in studio education across the disciplines of HCI, Architectural Design, and Industrial Design, and linking these social practices with the norms of professional practice (Brandt et al., 2013). This studio bridge (Figure 1) is used by Brandt et al. (2013) to explain tensions between disciplinary context and academic culture, including the practical implications of these tensions for the construction and enactment of studio pedagogy. In particular, it allows for a direct mapping of Shaffer's (2003) three types of structures across the studio, the professional community, and the academic community, including further interrogation surrounding the alignment (or lack thereof) of certain features across the three contexts. For instance, this mapping of structures across contexts might be used to identify surface or pedagogical structures that are common in both professional and studio contexts, but are not typical in the academic context, perhaps prompting additional inquiry into why this lack of alignment exists. While this construct is focused on the curricular or pedagogical level rather than the student level, it does begin to surface some important issues around what sources inspire a studio, and how the studio relates to a future professional/disciplinary community, with varying levels of control by the various stakeholders based on the positioning of the discipline within academia. These concepts will be more fully explored in the analysis and discussion of system relations (see chapter eight).

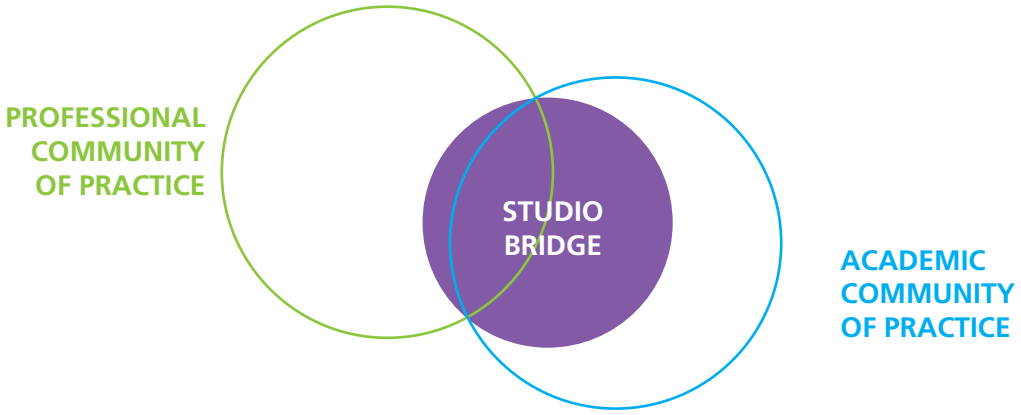


Figure 1. The "studio bridge" formed by the intersection of the academic and practice communities (adapted from Brandt et al., 2013).

Relationship of Studio Pedagogy and Subject Matter

Due to the often siloed nature of knowledge generation within design fields, only a small portion of the literature addresses the relationship of studio implementation and subject matter being taught. The disciplinary siloes encourage discussion of pedagogy with a community that already understands the specific nature of teaching and learning in a given discipline, with many particular details regarding implementation or the nature of disciplinary distinctives left unstated and unexamined. Even while the siloing of knowledge has been left unaddressed in many traditional fields of design, implementation of the studio form of pedagogy in non-traditional design fields has led to increased interest in how subject matter informs the implementation of surface, pedagogical, and epistemological structures in the studio. Reimer and Douglas (2003) carried out an implementation of studio-based learning in the context of HCI, drawing from architecture and product design to develop a course around traditional HCI content. The HCI subject matter was applied to pedagogical constructs observed in architecture studios, with a creation of group design projects and weekly crits, in an apparently direct translation from one discipline to another. Blevis et al. (2004) took a broader approach, drawing from physical spaces in numerous design disciplines at the Institute of Design in Chicago, choosing to focus on how similar

collaboration spaces could be formed in their department. They remark on the integration of a studio-based learning approach into their curriculum, explaining: "one of our biggest challenges in integrating HCI and design in a single curriculum is to create a studio-based learning culture, while still preserving the rigor of more traditional science-based learning." (p. 2). This statement reveals the challenge of combining traditions of science in design in a practical sense, with some HCI programs comfortable with relying on design-centric standards of rigor (e.g., Reimer & Douglas, 2003 and architecture), and others recommending a more inclusive approach (Faiola, 2007), without resolving the underlying epistemological differences between these ways of knowing and learning (see also Cross, 2001).

Brandt et al. (2013) present a more generalized framing of the relationship of studio integration to subject matter, proposing that integration should occur through the creation of the studio as a unique practice community or *studio bridge* that connects the academic and professional communities of the design discipline. In this way, it is important to understand the norms and expectations of professional practice, balancing these expectations with those of the academic community, and applying relevant studio concepts to create this studio bridge (Brandt et al., 2013). These issues surrounding the integration of a studio-based learning environment are especially important to consider in non-traditional design fields, as the choices of what elements of the studio to import, and in what way these elements are incorporated into the pedagogy can dramatically affect the felt student experience of the constructed pedagogy—as in the noticeable differences between an architecture-inspired HCI program (Reimer & Douglas, 2003) and one inspired by studio art blended with the scientific tradition (Blevis et al., 2004).

Conceptions of Design, Studio, and Aesthetic Experience in Instructional Design

Instructional design (ID) began its history as a craft-based discipline, with programs focused on audio-visual communication and instruction (Gibbons, Boling, & Smith, 2014). But beginning in the early 1970s, the educational film was on the decline, and through calls to professionalize the

field and create an intellectual as well as craft-based tradition (Gibbons et al., 2014), programs began to shift to a more scientific or "scientized" understanding of the discipline, often departing from understandings of design in the larger design community that had previously characterized the craft-based approach (NDEA to IST Years, n.d.). Core characterizations of design in ID have generally included an orientation based on process, design as systematic work, and a focus on problem solving (Smith & Boling, 2009). More recently, voices in the ID community have called for a broader view of design (Boling et al. 2011; Boling & Smith, 2012; Buchanan, et al. 2013), and along with it, a set of implications for educating students to understand design in this way (Rowland, Fixl, & Yung, 1992; Rowland, 1993). This call for a shift in how instructional designers are educated has resulted in a number of programs shifting to a studio or studio-like model of education (e.g., Boling & Smith, 2010, 2014; Clinton & Rieber, 2010; Ertmer & Cennamo, 1995; Hooper, Rook, & Choi, forthcoming).

In parallel with this turn to design in ID, there has also been a renewed focus on aesthetic experience as a productive lens for viewing and describing educational encounters. *Aesthetic experience* as a concept is grounded in Deweyan pragmatist aesthetics, defined by Parrish (2005) as an experience "that is particularly heightened and especially meaningful" (p. 19). Parrish (2005) first addressed aesthetic experience as a lens for describing and evaluating aspects of the educational experience that were not easily quantified or explained using traditional ID tools, including the felt narrative qualities that a learner might perceive. Parrish, Wilson, and Dunlap (2011) built on this perspective, positioning experience as "a transactional construct involving a person's encounters with their world over time" that included situational, temporal, and individual qualities (p. 15). Parrish (2014) furthered the discussion of how an individual interacts with a designed experience, including how an instructional designer might address designing for indeterminate experiences, or what he casts as the "half-known world"—where individuals bring their own agency and priorities to a learning encounter, crafting their own narrative in the process.

Both of these perspectives—design and its epistemological and ontological status in instructional design and the aesthetic experience of learning and a related focus on the individual learner—are important to position this study within an instructional design context. Studio pedagogy as an approach to teaching and learning in instructional design is still in its formative stages, and much of the existing theory base of the field does not provide instructional designers with the tools to adequately address an indeterminate learning experience or the crafting of unique, learner-driven narratives surrounding formally designed instruction. Similarly, the concept of aesthetic experience has not yet become dominant enough in ID to reshape the understandings of theory that guide the field.

Ethnographic Research in Studio Education

Multiple studies undertaken in the studio context have used the term *ethnography* to describe primary data collection method, but use of ethnography as a method of inquiry is inconsistently applied, with a broad range of application and differing standards of rigor, especially when comparing these studies to the ethnographies carried out in anthropology or sociology. I will evaluate two studies in the studio context which claim to use "ethnography" or "ethnographic methods" as a primary way of conceiving and structuring data collection, not with the intent of undermining the conclusions of these studies, but rather to identify a lack of full-scale, rigorous ethnographic inquiry in design education. Ethnographic research, as defined by the sociology and anthropology communities in which the method originated, is generally characterized by three key elements: 1) prolonged engagement, often a minimum of a year in duration (Hammersley & Atkinson, 1995; Stocking, 1983); 2) the ethnographer taking on a participatory role within the site under investigation, gaining insider status with groups or individuals of interest (Madison, 2005; Marcus, 2009); and 3) a reflexive quality, whereby the ethnographer uses interactions with the research subjects to constantly refine and focus her research questions and assumptions about the

social system being observed, made possible by being embedded in the site (Carspecken, 1996; Hammersley & Atkinson, 1995; Marcus, 2009).

Shaffer (2003) investigated an architectural studio course over a single semester, with attendance at approximately one-quarter of all studio hours. Field notes and interviews captured the experiences of the researcher, but it is unclear what role the researcher played in his observations, or how he was perceived by participants in the course under investigation. Cennamo and Brandt (2012) investigated three design studio courses in architecture, industrial design, and human-computer interaction using methods they termed as "ethnographic" over a duration of one to two semesters. This data consisted of "key classroom interactions, as identified by the instructor of each course, [that] were videotaped for analysis" and student and instructor design artifacts (Cennamo & Brandt, 2012, p. 845).

Other dissertation studies were also located, which took on some observational or ethnographic stance in the context of a design studio, including: a one-semester observation of an architecture studio to gain insights into instructional design education (Wolff, 2009); a one-semester participant observation of an multimedia production course in instructional design (Brown, 1999); an extensive set of phenomenological interviews of students in an architectural design studio learning environment (Lueth, 2008); a one-semester ethnography of an architecture studio focusing on application for liberal arts studies (Bilek-Golias, 2012); and an extended critical auto-ethnography on the education of architects, documenting the researcher's own experience over eight years of education (Corroto, 1996). These studies are, as a group, more extensive in breadth and depth than the other studies referenced above, and largely focus on documenting traditional studio culture within architecture, with the exception of Brown (1999) in instructional design. I was unable to locate any ethnographic studies of non-traditional design disciplines, which is the focus of this dissertation study.

While each of these studies employed methods consistent and appropriate for the forms of analysis and resulting conclusions, the lack of reflexive participation in the observational process (Cennamo & Brandt, 2012), an uncertain position of the researcher within the ethnographic site, and the lack of sustained participation (Shaffer, 2003)—all hallmarks of a traditional ethnography—undermine perceived rigor *as an ethnography* in the non-dissertation studies. In addition, none of these studies address the larger social system in which design education occurs, including a comprehensive exploration of social theory. These examples demonstrate the lack of ethnographic research in the context of design education—in emerging or non-traditional disciplines—that has been carried out with sustained interaction in a reflexive, participant observation context.

Emerging Critical Perspectives in Design Education

Since the early 1990s, a thread of scholarship centered in architectural design has addressed the studio with a critical perspective, promoting a more thoughtful and holistic approach to the study of design pedagogy (Crysler, 1995; Dutton, 1991; Stevens, 1995; Webster, 2006; Willenbrock, 1991). This critical perspective includes an evaluation of many traditional elements of studio culture, including formal critique, development of student expertise, and the roles of students and professors; these scholars call for a critical accounting of the underlying social and power-related assumptions of these elements.

Formal Critique and Design Juries

In architectural education, the work of Anthony (1991) served as a scathing critique of design juries and their often-destructive role on the development of student work. Anthony's work included a systematic study of architecture programs across the United States over a seven-year period, documenting student and faculty experiences of design juries—used as the summative form of evaluation for the design program. She addressed systemic concerns regarding the pedagogical and social effectiveness of this method of evaluation, suggesting alternate evaluation systems that reduce the power relations between faculty and student, and provide more accountability for

professional preparation and communication. Following this report on student experiences of the design jury, the American Institute of Architecture Students (AIAS) issued a formal report through a studio culture task force, responding to many of the challenges made by Anthony, resulting in a call for "redesign of studio culture" (Koch, 2002). While studio culture has likely changed since the production of Anthony's seminal work and the AIAS task force, critical attention continues to be paid to formal evaluative structures in design education. Later work by Webster (2006; 2007) reiterate this theme in architectural education, underscoring the role of power in the design jury "ritual" where critics are "ascribed...a considerable amount of symbolic power," which was often used to "impose [the critic's] notions of architectural habitus on students" (2006, p. 295).

Student Development of Expertise

Following the tradition described by Schön (1983) in his seminal text, *The Reflective Practitioner*, conceptions of studio pedagogy have frequently been reduced to an expert/novice dichotomy, as Schön pictures the isolated interactions around a design artifact between Petra (the student) and Quist (the professor). This individualistic conception of design education has been criticized in recent years for its lack of a depiction of the social environment of the studio (Webster, 2008), often perpetuating legitimated use of power (Willenbrock, 1991) and positing a uni-dimensional transfer of knowledge from professor to student (Crysler, 1995) that allows only certain types of students to succeed (Stevens, 1995; Willenbrock, 1991).

Research on expertise in a generic context has been carried out for decades (e.g., Dreyfus, 1981; Dreyfus, 2003), and has more recently been imported into the design literature to make sense of the development of design expertise. The fullest examples of how include the adaptation and extension of Dreyfus' initial *generic model of expertise* by Lawson and Dorst (2009) and a broader philosophical recasting of expertise within design by Nelson and Stolterman (2012).

Lawson and Dorst (2009) outline a framework of expertise, drawing extensively on Dreyfus, that includes six main levels of expertise: from novice to visionary (Table 1). These levels are not

meant to indicate a completely homogenous arrangement of expertise in design (i.e., one might be an expert in one area and an advanced beginner in another), and do not indicate how a designer should be educated. But taken as a relatively comprehensive understanding of expertise, moving beyond the novice/expert binary that still characterized many conversations about design development at the time it was proposed, this model provides a more granular understanding of these differences.

Table 1: *Levels of Expertise (adapted from Lawson & Dorst, 2009)*

Level of Expertise	Description (quoted from Lawson & Dorst, 2009)
novice	A novice will consider the objective features of a situation as they are given by the experts, and will follow strict rules to deal with the problem.
advanced beginner	For an advanced beginner the situational aspects are important, there is some sensitivity to exceptions to the "hard" rules of the novice. Maxims are used for guidance through the problem situation.
competent	A competent problem solver works in a radically different way. Elements in a situation are selected for special attention because of their relevance. A plan is developed to achieve the goals. This selection and choice can only be made on the basis of a much higher involvement in the problem situation than displayed by a novice or an advanced beginner. Problem solving at this level involves the seeking of opportunities. The process lakes on a trial-and-error character, with some learning and reflection. A problem solver that goes on to be proficient immediately sees the most important issues and appropriate plan, and then reasons out what to do.
expert	The expert responds to a specific situation intuitively, and performs the appropriate action straightaway. There is no problem solving and reasoning that can be distinguished at this level of working. This is a very comfortable level to be functioning on, and a lot of professionals do not progress beyond this point.
master	The master sees the standard ways of working that experienced professionals use not as natural but as contingent. A master displays a deeper involvement into the professional field as a whole, dwelling on successes and failures. This attitude requires an acute sense of context, and openness to subtle cues.
visionary	The visionary consciously strives to extend the domain of operation developing new ways of doing things, outcomes, definitions of the issues, opens new worlds and creates new domains. The visionary operates more on the margins of a domain, paying attention to other domains as well, and to anomalies and marginal practices that hold promises for a new vision of the domain.

Nelson and Stolterman (2012) also discuss expertise, using this construct to characterize design as the "first tradition" and a unique way of knowing, separate from science or other epistemologies. One of these characterizations relevant to this discussion is the difference between

routine expertise—which relies on technical rationality (Schön, 1987)—and adaptive expertise, which respects the uniqueness of design activity. This distinction is made more clear by the authors:

> *The assumption behind routine expertise, or 'technical rationality' (Schön 1987), is that nothing fundamental changes in the background or foreground of design situations, and that these situations can be approached as if they are members in predetermined categories. It is believed that the answer to any particular design issue will be equally valid for the next issue in any place at any time.…However, when it comes to design, situations are unique, undergoing change continuously.* (Nelson & Stolterman, 2012, p. 227)

The distinction between routine and adaptive expertise is carried even further into the design dimension, describing the intentionality that is characteristic of design (i.e., design as "intentional change"):

> *It is important…to make a distinction between 'finding meaning'—that is, adaptive expertise—in things that happen, and 'making meaning'—design expertise—by causing things to happen. The former is reactive and adaptive, while the latter is proactive and intentional. To be in service is to be proactive.* (p. 43)

Each of these renderings of expertise as they relate to design activity and development will be used to demonstrate how students move from a novice or naïve status to competent or expert design practitioner—as the student moves out from the classroom and into service. In a more specific HCI framing, Siegel and Stolterman (2008) discussed a series of transformational phases and barriers design students in that discipline passed through as they moved from a period of "pre-emergence" to "transitional" and finally to "designerly thinking." These phases were intended to represent the primary phases and characteristic barriers that students worked through during their first semester of graduate design education in HCI/d. Some of the barriers that students worked through included: belief in a "best solution," technology v. human-centered design, looking beyond "me" to "we," the role of user research, loyalty to a specific idea, avoiding critique, and reflecting on personal practices. Some of these barriers have been validated in later studies of this same student population (Gray & Siegel, 2013; Gray, 2013c), and this study will address the transformational "metamorphosis" of design ability, particularly on the part of new students during the Fall 2013 semester.

While expertise is used as one framing for this study, recognizing that students move through various levels of expertise during their time in the HCI/d program, my primary focus will be on the developing designerly identity of the student—how they identify themselves in relation to design activity. In foregrounding identity, I will address identity formation as separate from the development of competence or expertise, assuming that the latter is taking place, even if it is not addressed in an explicit, comprehensive way. Students and graduates of this program have a strong history of getting jobs at top companies, such as the students documented in Gray (2014). The program has a reputation for producing qualified interaction and user experience designers and researchers, so the students' general level of expertise is assumed, and no explicit data was collected from classroom or non-classroom activities to directly identify design expertise.

Studio Education as Non-Neutral

Dutton (1987) introduces a critical approach to the discussion of studio culture, assessing the value of a perspective on the pedagogical experience of the studio that moves beyond an attention to formal curricular knowledge. This concept of the "hidden curriculum," coined by Jackson (1968) and popularized by Giroux and Purpel (1983) is identified as: "unstated values, attitudes, and norms which stem tacitly from the social relations of the school and classroom as well as the content of the course" (Dutton, 1987, p. 16). Dutton's perspective on the hidden curriculum is embedded in the epistemological framing of critical pedagogy, which will be discussed next.

Critical Pedagogy

The concept of a critical pedagogy first emerges in the work of Freire (1970/2000) drawing on Marxist theory, characterizing the modern educational system as being dominated by oppression and dehumanization—a struggle between students looking to be recognized as free, autonomous beings, and the distortion or subjugation of this freedom by the oppressor. This so-called "banking" approach in traditional, oppressive educational systems assumes that students are

empty and need to be filled, where the teacher knows everything and the student knows nothing, resulting in a dehumanization of the individual student (Freire, 1970/2000). In contrast, Freire (1970/2000) calls for a "problem-posing" form of education, which "affirms men and women as beings in the process of *becoming*—as unfinished, uncompleted beings in and with a likewise unfinished reality." (p. 84, emphasis in original). In this respect, critical pedagogy and progressivism have a substantial area of overlap, both calling for a humanization of the student, giving them freedom to work out their own educational experience.

The critical pedagogy perspective, however, moves beyond a call for individual freedom of the student to an accounting for power relations and norms taught in the hidden curriculum, and how these isomorphisms link to the larger social system in which students and faculty live and teach. This perspective is currently used in a wide range of critical explorations of educational systems, drawing on feminist theory, queer theory, critical race theory, and others to describe oppression and struggle in traditional education. Critical pedagogy is positioned in opposition to the increasingly positivist, market-driven orientation of teaching (Giroux, 2011), even while scholarship on teaching has become more dominantly post-positivist, and is used as a way to reflect on inequalities that are intrinsic to certain forms of education from both student and instructor points of view (Darder, Baltodano, & Torres, 2003). Freire's (1970/2000) concept of "banking education," then, applies not only to the transmission of objectified content to students that are empty and need to be filled, but also to training in rule-based procedures and norms that reproduce the structures of the larger social system (e.g., Willis, 1977), as can be found in the relations between students and the professional community of design in this study.

A critical pedagogy perspective has been applied by Dutton (1991) and Crysler (1995) in architectural education, but this perspective has not been commonly used as a framing in other areas of design education. In an architectural design context, this perspective has revealed the unequal power relations inherent to traditional forms of studio education (Dutton, 1991;

Willenbrock, 1991), and the need for a more democratic model of studio practice that moves beyond a transmission model of teaching (Crysler, 1995). In traditional studio pedagogy, the professor and students are cast in a master-apprentice relationship, with interactions dictated through high stakes evaluations that are often public in nature. Studio activities are centered on design activity, focused implicitly on the development of professional judgment, with regular opportunities for evaluation, just-in-time teaching of concepts and methods, and visible work-in-progress. Anthony (1991) and Dutton (1991), among others, consider these interactions to be unidirectional in focus within a traditional studio implementation, with legitimized teaching only occurring in professor to student interactions.

This critical pedagogy research in architecture is consistent with the concept of *immanent critique*, which has roots in the work of Hegel and Marx, and has also been championed by Adorno in the context of critical theory. According to Jarvis (1998):

> "An immanent critique is one which 'remains within' what it criticizes. Whereas a 'transcendent' critique, a critique from outside, first establishes its own principles, and then uses them as a yardstick by which to criticize other theories, immanent critique starts out from the principles of the work under discussion itself. It uses the internal contradictions of a body of work to criticize that work in its own terms." (p. 6)

It is important to note that the oppressive nature of many elements of the studio pedagogy, drawn out by Anthony (1991) in the design jury and by Webster (2008) in a neglect of how individuals function within the social milieu of the studio, has often been recognized first by these researchers when they were still in the student role. This *feeling* or *sense* is often left unarticulated, but work in a critical pedagogy framing attempts to draw out these latent forms of critique found in everyday student experiences, directing them towards immanent critique that is made explicit with the goal of exposing dominant ideologies—what Freire (2000) refers to as *conscientization*.

Critique in Studio Pedagogy

Critique is widely considered to be the core of the studio signature pedagogy (Cennamo & Brandt, 2012; Hokanson, 2012; Klebesadel & Kornetsky, 2009; Shulman, 2005). Although the

object of critique shifts widely depending on the design discipline, the implementation of critique as a function of the pedagogy is relatively consistent, and is used as a formative and summative form of evaluation (Anthony, 1991; Blair, 2011; Ruchhoeft, Bannerot, & Kastor, 2004), a method of design discourse (Senturer & Istek, 2000; Vyas, Veer, & Nijholt, 2012), and a heightened form of professional communication that prepares students for professional practice (Dannels, Gaffney, & Martin, 2008; Gayol, 1994; Morton & O'Brien, 2006). Beyond these more traditional implementations of critique in a design pedagogy, a subset of the literature posits that critique plays a reflective role that incorporates the construction of meaning, enhancing the individual development of the design student beyond merely providing evaluation or feedback on the development of a specific artifact (Conanan & Pinkard, 2001; Ellmers, 2006; Exter, Korkmaz, & Boling, 2009; Gray, 2013a; Jeffers, 1994; Senturer & Istek, 2000). Because critique forms the nexus of studio education, an understanding of how critique is implemented and used in all of its forms is important in order to reveal and describe the underlying structures of the design studio in a rigorous way.

Categories of Critique

Hokanson (2012) offers four categories of critique that traditionally occur within studio education: formal, seminar/group, desk, and peer critique, drawing on a substantial review (Blythman, Orr, & Blair, 2007) from the United Kingdom on the state of critique in a variety of design disciplines. While other taxonomies of critique exist (Oh, Ishizaki, Gross, & Do, 2012; Parnell, Sara, Doidge, & Parsons, 2012; Utaberta, Hassanpour, Zaharin, & Surat, 2010), these four categories will be used as they represent the broadest range of critique that is applicable across a range of design disciplines (see Table 2), as differentiated by audience (i.e., the number of students and/or professors involved), formality (i.e., participants and stakes of evaluation or completeness of a design), and type of desired interaction (i.e., in what manner is work critiqued). The range of

factors represented through these four categories of critique is directly applicable to the exploration of informal studio spaces in this study.

Table 2: Types of Critique Compared by Audience, Type of Interaction, and Level of Formality

Type of Critique	Audience	Type of Interaction	Level of Formality
Formal	Student(s), professors, and/or outside jury members	High stakes evaluation of completed work	High
Seminar/ Group	Students and professor(s) in a classroom environment	Formative assessment of in-progress work or evaluation of completed work	Moderate to high
Desk	Student and professor (with possibility of being overheard by other students), often in classroom environment	Formative assessment of in-progress work	Moderate
Peer	Students	Context specific. Not prescribed by the type of critique.	Low to moderate

Taxonomies of Critique

Other authors, primarily drawing from an architectural design perspective, present alternate taxonomies or typologies of critique. Oh, et al. (2012) define a broader taxonomy of critique based on a meta-review of design literature, basing their theoretical framework of critique on three complementary perspectives: the number of students, public to private nature of the critique, and the informal to formal nature of the critique (see Figure 2). Within the architectural education community, taxonomies or typologies created to orient new students to the studio community (e.g., the book *The Crit* meant for beginning architectural design students) address critiques along a spectrum from informality to formality within the development arc of a project in the studio. A sample range of critiques, listed from most informal to most formal may include: individual critique, formative critique (interim), summative crit (final), peer critique, group critique (expert), public critique, written critique (potentially online), seminars, and panel discussions (Blythman et al., 2007; Oh et al., 2012; Utaberta et al., 2010).

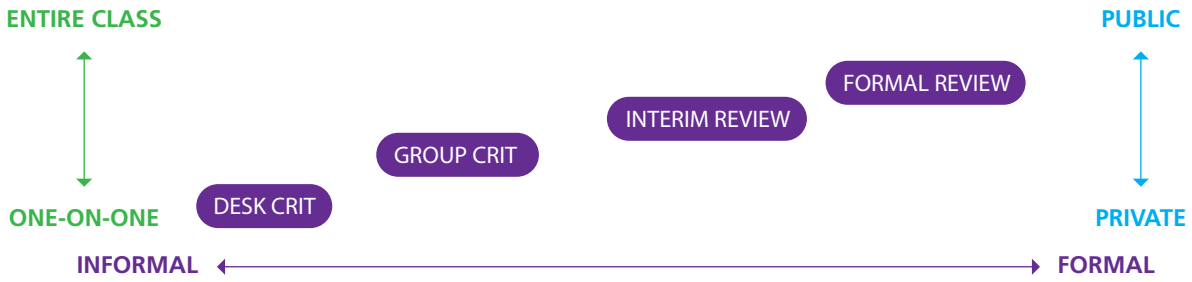


Figure 2. Three perspectives of critique settings including: number of students; public—private; and informal—formal (Adapted from Oh, et al., 2012).

Analytic Frameworks of Critique

Critique has been most commonly studied from the perspective of the master/student relationship, and several models and taxonomies have been developed to explain these interactions. These existing frameworks are helpful in assessing the conformance of informal peer critique to the known structures of formal classroom critique, the focus of this study. I will briefly outline five existing frameworks for analyzing various aspects of critique, including: the process of critique (Oh et al., 2012), the student's pedagogical development in relation to critique (Exter, Korkmaz, & Boling, 2009), the genres of feedback in critique (Dannels & Martin, 2008), the ways in which knowledge is conveyed during critique (Uluoglu, 2000), and the structures of peer critique (Gray, 2013a).

Oh, et al. (2012) propose a process model (see Figure 3) that describes how instructors give critique to students, moving from initial observation of a student's design (Step 1), to a recognition and identification of components of the design to focus on (Steps 2 and 3), an internal sequencing of feedback based on the components selected (Step 4), and an internal selection of communication modality (e.g., sketching, gesture, example) and externalization of that delivery type (Steps 5 and 6). This model may be used to note divergence or conformance of the linear process of critique when a student takes on the role of critic in place of the instructor.

Figure 3. Process model of critiquing (Adapted from Oh, et al., 2012).

Exter, et al. (2009) are concerned with the pedagogical implications of critique in the development of the design student, with a student moving from an initial stage where they accept critique in a declarative way from the instructor to understanding critique in a more holistic way (see Table 3). This also represents an evolution in a student's conception of critique, including the ability of the student to provide critique to peers as the stage of development increases. These stages may indicate the mutual understanding of the critic and recipient about their conceptions of design and the utility of critique, both in direct application and far-transfer of critique suggestions.

Table 3: *Stages of Development of Understanding of Critique (adapted from Exter et al., 2009)*

Stage	Description
1. Mechanical	Do what the instructor says
2. Practical	Understand the utility of the critique for improving their own work
3. Conceptual	View insight from this critique as generalizable to multiple designs
4. Integrative	View critique as a collaborative part of the full design process

Note. Summary of Exter et al. (2009) stages of student development in their understanding of critique.

Dannels and Martin (2008) propose a typology of feedback given in the act of critique from the perspective of the critic (see Table 4). These types of feedback include: assessment of a design artifact (judgment, interpretation, free association, comparison), discussion of past or next steps in the design process (process-oriented, brainstorming, direct recommendation, investigation), or the role of the individual designer within their design discipline (identity-invoking). This typology may be used to directly assess the discursive content of peer critique, as seen from the perspective of the critic, in conjunction with existing structures of informal critique (Gray, 2013a).

Table 4: *Genres of Critique (adapted from Dannels & Martin, 2008)*

Genre	Description
Judgment	Interpretation or observation, often an assessment of quality from the critic's perspective
Process-Oriented	Statement or question about the approach or design process that led to a design
Brainstorming	Questions or statements about imagined possibilities or next steps, "what-if" questions, often rhetorical
Interpretation	Critic telling the student what they see, and how they are making sense of the design
Direct Recommendation	Specific, targeted advice about a specific aspect of a design
Investigation	Non-rhetorical question about the design or design process
Free Association	Associative statements containing initial reactions to a design, "it looks like…"
Comparison	Strategic comparison or contrast with an external artifact or concept
Identity Invoking	Reference to student's place as a designer in a future professional community

Note. Summary of Dannels and Martin (2008) typology of feedback provided in design studios.

Uluoglu (2000) describes a model of the knowledge of design, and how this knowledge is communicated in a transmitter-receiver model between the "studio master" and student (see Table 5). Each proposed knowledge topic is transmitted via declarative and procedural means, with categories and structuring of knowledge building on top of communicative representational forms, before being embedded within content that is transmitted to the student. The external structure of this model may be helpful to explain, in a non-transmissive framing, the meaning making through intersubjective space that is constructed in the process of critique. In addition, the communicative forms and types of knowledge may correlate with the Dannels and Martin (2008) typology of feedback in an analysis of peer critique.

Table 5: *Knowledge of Design Topics, Including Declarative and Procedural Aspects (adapted from Uluoglu, 2000)*

Knowledge of Design	Declarative	Procedural
Categories	Concepts for naming and specifying things and events	Control and manipulation of the design process. Integrate external knowledge.
Structuring	Describing or defining positive or negative issues from the student's work, with these units forming a network of relations with hierarchy	Structures become directional rather than static, altering the course of the design
Representation	Different communicative forms, including: interpretation, coaching, questions, demonstration, description, completions, examples, reminders, positive evaluation, analogies, problem statement, scenarios, conflict statement, negative evaluation, and other (informal conversation)	Type of knowledge, linked to communicative forms, including: reflective knowledge—understanding things, operative knowledge—how to do, contemplative knowledge—thinking about things, directive knowledge—take the student to a further stage, associative knowledge—bridge the gap between ideas and concretizations, and other (informal)
Content	Quality of knowledge, based in an individual person	Attribution of meaning, dependent on the qualities of the conceptual structure

Note. Summary of Uluoglu (2000) model of knowledge of design, as transmitted in studio critique.

Gray (2013a) provides an exploratory structural analysis of peer critique in the context of HCI, identifying discursive structures for both the critic and the recipient of critique. Primary structures for the critic include: identifying limitations of the prototype and projection of worst case scenarios. Primary structures for the critique recipient include: identification of the problem space, setting new scenarios based on critique, and internalizing of new perspectives. Additionally, structures for beginning and concluding critique, collaboratively projecting user reactions, and identifying potential scenarios of use are identified. While this structural analysis was based on constructed peer critique dyads, it is anticipated that some of these structures may also occur in organically occurring peer critique.

State of the Literature on Critique

As part of my exploration into the investigation of critique in the literature, I performed an open-ended search of the use of critique in a range of traditional and non-traditional disciplines. Each source (n=69) was then categorized by the categories of critique it mentioned (formal, seminar/group, desk, or peer), the context of the research (K-12, undergraduate, graduate, professional practice), the field of design, and other features of the research, which include whether empirical data was provided, whether comparisons between professor and student were included, whether critique was identified primarily as an instrument of evaluation, and whether the source provided a critical perspective on critique. A full listing of the sources that were evaluated are included in Appendix A.

Table 6: *Summary of Literature on Critique by Category and Design Discipline*

Design Discipline	Formal	Seminar/ Group	Desk	Peer
Architecture (28)	16	12	9	5
Engineering (2)	1	1		
Fashion Design (1)	1			
Graphic Design (11)	5	3	3	1
HCI (4)		2	1	2
Industrial Design (7)	4	4	2	1
Instructional Design (3)		3	1	
Landscape Architecture (7)	5	4	3	1
Software Design (1)				1
Studio Art (17)	1	9	5	1
Theater (1)		1	1	1
Total	33	39	25	13

Note. Total number of sources from each discipline provided in parentheses. Categories of critique are applied non-exclusively, so each column may add up to more than the total number of unique references.

The literature addressed in this search revealed a strong bias towards research on critique in the field of Architectural Design, with 28 sources addressing critique in this field (see Table 6).

Other common fields included Studio Art (n=17), Graphic Design (n=11), Landscape Architecture (n=7), and Industrial Design (n=7). Evaluation of this literature by field and categories of critique reveals additional patterns of critique use, with Architectural Design focusing primarily on formal critique (n=18), while Studio Art included only one instance of formal critique, with 9 instances of seminar/group critique and 5 instances of desk critique. Most interesting is the relative lack of literature addressing peer critique, with only 13 sources referencing this category of critique, even in an indirect or passing manner, often assuming its existence, but without further critical inquiry. Only three sources addressed peer critique as a focus or primary source of empirical data, Gray (2013a; 2013b) in the context of an HCI studio, and Joel (2011) in an interdisciplinary studio. This proposed study will focus on this final category of critique, defining peer critique as any form of informal, non-classroom critique between peers in the context of a design studio.

Each of the primary categories of critique will be discussed in turn, including relevant literature and its use in a range of design disciplines as a part of the planned pedagogy, leading to an evaluation of current conceptions and use of peer critique in studio pedagogy.

Formal Critique

Formal critique, often carried out in a design jury format, is the foundation of summative evaluation in many traditional design disciplines. This model of critique is most substantially embedded in the field of architecture (Anthony, 1991; Parnell et al., 2012), where design juries have been used as an end-of-course or end-of-semester summative evaluation of project work. The design jury generally centers on a student presentation and intensive critique of a design project, with an approximate duration of one to two hours (Dannels, 2005), and a design jury comprised of instructors and external design professionals, who ask the student questions and render a final evaluative judgment (Oh et al., 2012). Students may also be invited to this form of critique, with both private and public design juries common (Blythman et al., 2007; Parnell et al., 2012).

This model of critique has received a wide range of criticism, with detractors citing disconnects between studio and professional practice and the jury model of critique (Graham, 2003; Hassanpour, et al., 2010; Morton & O'Brien, 2006) and the lack of objective criteria by which projects are judged (Anthony, 1991; Webster, 2006). There is a significant issue in regard to the lack of student equity in this form of critique, as students become defined by the cultural or normative assumptions of the design jury (Webster, 2006), become dehumanized or diminished on the basis of gender or race (Shannon, 1995), and struggle with a lack of consistency or structure (Hassanpour, et al., 2010). This form of critique is also important to enculturate and socialize the student into the field of study (Dannels et al., 2008), but can prevent the student from effectively demonstrating how they will perform in the context of practice (Blair, 2007; Percy, 2004).

Seminar and Group Critique

Group critiques are one of the most consistently used forms of public critique, and are implemented in some form across almost every traditional and non-traditional design discipline I reviewed. This form of critique includes the students in a course and one or more professors or external design professionals engaging in a formative or summative evaluation of project work (Hokanson, 2012). While this category of critique most often takes place in a studio context, it may be carried out in other small group formats with a range of knowledgeable others, including professional designers (Blythman et al., 2007; Oh et al., 2012), instructors (Oak, 1998), and tutors (Parnell et al., 2012).

Group critiques take a variety of forms, including pin-ups of work of selected students or all students (Gayol, 1994), and may be instructor or student-led with a range of discursive structures (Barrett, 2000; Brown, 1999; Gaffney, 2010). In this model of critique, the stated goals of critique sometimes emerge in opposition to what is communicated to students (Belluigi, 2008; Gayol, 1994). Instructors may communicate that they encourage student participation, but then unintentionally dominate the conversation, limiting the communicative power of students (Barrett,

1988; Gayol, 1994). Conversely, the small and relatively informal nature of these group critiques, especially when carried out in smaller groups, can engage students with less confidence, allowing them to participate in a more active way (Oh et al., 2012).

Desk Critique

Desk crits are used to describe a range of critique activities undertaken between a single student and an instructor or knowledgeable other, encompassing formative and summative reviews of design projects. While many traditional studio pedagogies use the desk crit as a method of evaluation in the design studio as a complement to the "pin-up" or group critique (Klebesadel & Kornetsky, 2009; Parnell et al., 2012), other implementations of studio pedagogy use a one-on-one critique as a private conference rather than a primary facet of studio interaction (Taylor & McCormack, 2006). This form of critique, especially when carried out in the public studio environment, allows for students to overhear critique and occasionally participate or benefit from the critique in this secondary way (Hokanson, 2012).

The desk crit is a vital activity in the studio pedagogy (Schön, 1985), engaging students in a direct way and individually assessing their progress. Unlike more formal group or jury critiques, this formative assessment of projects is carried out throughout the semester, and can encourage the development of a range of design knowledge (Oh et al., 2012; Uluoglu, 2000). Additionally, this mode of critique allows for a bi-directional communication between instructor and student, with the instructor gaining an understanding of a student's progress and way of thinking, and the student learning the expectations and rationale of the instructor (Uluoglu, 2000).

Peer Critique

Peer critique is the least defined and studied of the four categories of critique, with a range of definitions depending on the design discipline or implementation of pedagogy. For the purpose of this study, peer critique is used to describe informal, non-classroom interactions between students (Gray, 2013a, 2013b, 2013d), and can take on a socializing, professional orientation,

while also increasing the student's ability to validate and understand design choices in the context of a specific design (Hokanson, 2012).

Klebesadel (2008) states "Artists learn by being critiqued, but they also learn by critiquing the artwork of their peers." (p. 115) noting the importance of non-professor interaction in the development of design expertise. While peer critique is frequently referenced as a natural form of socialization in the studio environment (Dannels & Martin, 2008; Dannels, 2005; Joel, 2011), there is little literature to document this form of critique, particularly in relation to other formal pedagogical structures. Gray (2013d) documents how the structures of peer critique may make explicit the student's meaning-making and identity formation, using the language of Bourdieu's *habitus* to explore how students interact in opposition to or support of the surrounding studio pedagogy, invoking the discursive structures of this form of critique (Gray, 2013a). Joel (2011) references peer critique as a natural form of interaction in an interdisciplinary design studio, and calls attention to the peer networks, which underlie these interactions and facilitate the communication of informal feedback. Bowring (2000) expands this notion of critique in a professional direction, concluding: "There is also a sense that students need to be prepared for life beyond the studio, and to develop strategies for responding to the potential range of reactions to their work in the 'real world'." (p. 46).

Utaberta, et al. (2011) use the term "peer critique" in a different way, assuming that students will critique each others' work, but they "need to be given agreed criteria to critique against," and a tutor will act as facilitator when questions arise (p. 98). This mediated or facilitated form of peer critique seems to be a dominant view in the architectural design community (Hassapour, et al., 2010; Melles, 2008), casting peer critique as a type of formative evaluation that occurs in the presence of a knowledgeable other (e.g., professor or practicing architect). This aligns with conceptions of peer assessment found in other design disciplines such as graphic design

(Eshun & Osei-Poku, 2013) and HCI (Purchase, 2000). Infrequently, peer critique within the definition used in this study has been used as part of the formal pedagogy, with positive results:

> *When I asked a group of first-year students to do a peer critique of each other's work they were horrified, and said they thought only teachers could do critique. Yet, on realising that they were familiar with the body of theory to which the project related, their confidence increased. Through participating in a systematic critique of a randomly selected classmate's project, their overall understanding of the studio was considerably enhanced. Their ability to self-critique also improved. This was put into practice when they were told they had to return to the projects they believed they had 'finished' and redo them. Once their disgruntlement at having to do more work had passed they welcomed the opportunity to rework their projects. The process of giving and receiving critique, together with the revelation that design is not 'done' when you hand it in, resulted in an appreciable improvement in the standard of design. Many of the written evaluations of this project identified the peer critique as the most enjoyable part of the process.* (Bowring, 2000, pp. 45-46, underlining in original)

The most non-institutionalized conceptions of peer critique seem to be found in non-traditional design disciplines that have not assumed the same power relationships that are often embedded in traditional fields of design. Conanan and Pinkard (2001) implemented an asynchronous online critique system, allowing students in their graduate software design courses to critique each other's work. Gray (2013a, 2013b, 2013d) reports on the peer critique interactions between students in an HCI program, without the presence of a facilitator or knowledgeable other. Oh, et al. (2012) also recognize this less controlled form of critique in their meta-review of literature on critique. There are also beginning efforts to use digital spaces as a context for participants to engage in peer critique, both in academia (Bailey, 2005; Conanan & Pinkard, 2001) and in practice or non-academic uses (Xu & Bailey, 2011, 2012).

Key Concepts in Critical Research as Applied to This Study

In order to situate the critical methodological approach in this study, described in the next chapter, I will provide a very brief introduction to a number of key concepts. These explanations are not meant to be exhaustive, but rather a framing of my own research perspective in relation to this critical method, and to outline a basic set of vocabulary to be used in later chapters. For additional reading on these concepts, I would recommend several sources that inspired this section:

Carspecken (1996) as an overview of critical qualitative inquiry and practical guide to reconstructive analysis; Carspecken (2003) as a more thorough historical grounding into the issues surrounding critical research, especially helpful in separating criticalism from postmodernism; and Zhang and Carspecken (2013) as an extension of the previous sources in describing a new analytic concept, *content inference fields*, which may be a productive way to frame the discussion of communicative acts in regard to fields within a system.

Theoretical Concepts

A discussion of several core concepts related to critical analysis are important to understanding the aims and processes of reconstructive analysis, as used in this dissertation. Many of these terms relate to identity and meaning-making in a direct way, and will be used extensively in the detailed reconstructive analyses in chapter seven.

Three Formal Worlds: Objective, Subjective, and Normative-Evaluative

In his Theory of Communicative Action, Habermas (1984) proposes that all communicative acts have three dimensions, related to "formal worlds." Each of these worlds takes on a different subject position or perspective, and can be judged by differing standards of validity related to the world the claim resides within. All communicative acts contain validity claims in all three formal worlds (discussed below in Intersubjective Space), which fuse together in a moment of mutuality where we understand ourselves, and others have the capability to understand us. These worlds are formal and not just simple ontological worlds because any communicative act will necessarily *claim* the boundaries between these worlds in contestable ways, while also recognizing there is no way to access the formal worlds without addressing the boundaries between them. Each formal world can be described briefly as follows:

An *objective* validity claim is one that takes on a multiple access perspective, whereby a phenomena may be judged for what it is or what appears by multiple subjects. These claims can be resolved through standards of truth and efficacy, and are concerned with "the" world. In contrast,

a *subjective* validity claim takes on a limited access perspective, or an expressive attitude of the individual. These claims can be resolved through adequacy of standards for criticism, and are concerned with "my" world. The grounds are our own experience, which each of us have alone; while we have privileged access, we do not have direct access, as any of these claims are interpreted by us in the process of realizing they exist, and when we have awareness of them. The subject can be wrong about what they are experiencing, and can be reproduced in a systemic way through psychological processes like denial. Finally, a *normative-evaluative* validity claim assumes a perspective of what *should* or *ought* to be. These claims can be resolved by countering the rightness of norms or actions, and is concerned with "our" world. Normative claims must be rational, in the sense that they are internally coherent, and are not merely a matter of opinion; normative claims should have an implied argumentative structure built around them, which indicate consensus based on reasons. In the expression of communicative acts, the actor "demarcates" their own unique position in relation to all three of the formal worlds; no single world contains the identity claim which might be said to constitute the "I" component.

Intersubjective Space

For any given communicative act, we as actors have an felt experience, and fused within that experience are all three subject positions: 1) the subjective or limited access, individual sense of the "I"; 2) the normative perspective of what ought to be; and 3) the objective or multiple access perspective, or the individual and collectivist sense of "me." Only as these three validity claims first fuse and then emerge together does our act make sense. Through this reciprocal and reflexive process of acting and forming validity claims surrounding that act, an intersubjective space becomes possible between two individuals and mutual understanding is able to emerge. This intersubjective space is the space that is formed whenever we act communicatively; and by acting in a communicative space, we have already taken on multiple subject positions (see above), and the validity of our acts involving meaning are assumed. It is possible, however, to consciously determine

the validity of our acts, either during or just after we act communicatively, deliberately taking on other subject positions to assess the validity of our heretofore implicit validity claims. When we, even as solitary actors, position-take in this way, we imagine how our communicative acts might be viewed by others, either regarding the meaning of an act or the next possible act(s), which is inherently intersubjective. "It is through norms, 'rules,' that position-taking is made possible. They are the hinges upon which we swing from first to second and third person positions. It is only because of norms that position-taking is at all possible" (Carspecken, 2003, p. 1024). It is also important to note the role of reflection, as it is understood in the design discourse (i.e., Schön's "reflection-in-action") in relation to this concept of position-taking: "Position-taking is what structures higher levels of thought…It is the basis of what we mean by 'reflection.' Thinking is dialoging internally. Reflecting is taking a second and/or third person position in relation to one's own thoughts." (Carspecken, 2003, p. 1023).

Objectivation and Thematizing

Objectivation is making something available for consideration or discussion apart from the context in which the concept arose. This involves bringing an idea that was previously contingent on the context in which it arose, and removing the idea from that context so that it can be discussed on its own terms. Zhang and Carspecken (2013) refer to this as when "actors are in the process of acting communicatively in relation to something distinguished from their communicative actions" (p. 206). This discursive move is often indicative of higher order thinking skills, as it moves the locus of conversation from an immediate context into a metacognitive space.

Thematizing is often related, describing the process by which an individual is able to make sense of the underlying rationality of their actions. Zhang and Carspecken (2013) describe this phenomenon as "foreground[ing a structure] for consideration…usually with explicit linguistic representations" (p. 206). This foregrounding process requires an implicit understanding of ones' tacit assumptions, and the ability to express them. This describes the challenge of doing research

on topics for which internally coherent rationality is largely tacit and inaccessible to participants (Nisbett & Wilson, 1977). This is especially true in design research, where an increase in expertise on the part of the designer is generally linked to less explicit awareness of one's internal rationality (Dreyfus, 1981; Lawson & Dorst, 2009).

Typifications and Roles

Carspecken and MacGillivray (1998) define typifications as "specify[ing] a range of possible roles as well as norms, audiences, and such things as interactive rhythm and tempo" (p. 179). This means that the idea of a *typification* is related to the interactive setting in which communicative acts takes place—a structure of intersubjectivity—but has a deeper level: "a situation is [seen as] meaningful when it is recognized as such through a typification" (Carspecken & MacGillivray, 1998, p. 179). While typifications are a relatively high level construction, such as our understanding that we are in a business meeting, not playing pool at the bar, the concept of a *role* is somewhat less situationally dependent, but are still often naturally indicated by a typification. As participants in a communicative act, we can play multiple roles according to the immediate context. For instance, we might start a conversation by playing a friend or confidant role, then later shift to a mentor role or a "devil's advocate" role. Interactions always take place within setting structures, and interactions between multiple individuals can change the typifications in use. Thus, the interactive setting can be seen as a superset of multiple interactions between individuals who take on roles that can be further understood through typifications.

In this study, the concept of roles and typifications is used to describe in richer detail how students and faculty interact in communicative settings, the varying roles that students play as they develop in the program, and the typifications that are assumed by professors and students in relation to professional practice.

Structure, System, and Lifeworld

These three concepts are intimately related to each other, and while I cannot provide a full reckoning of the sometimes subtle differences between them in this brief review, I will attempt to provide some grounding explanation. The *lifeworld* is ontologically prior to the concept of a *system*, providing the conditions for the possibility of knowing anything at all. In this sense, the lifeworld remains unfalsifiable, and because the construction and representation of systems always exists within a lifeworld, the system can never encapsulate the lifeworld in its entirety. This lack of full thematization of the lifeworld in terms of a system indicates that while many structures in a complex society move from the lifeworld to the system, the system can never subsume and explain everything. Systems, however, can escape lifeworlds in that they are constituted by functional relations between action orientations, actions, and action consequences such that action consequences reproduce action orientations. Thus, actors may contribute towards functions for a system that is beyond their grasp; these actions can nevertheless be explained by the actor through their own lifeworld, but these explanations do not have to extend to the level of system. Lifeworlds have to do with the orientations of actors (e.g., values, norms, beliefs, and identity commitments), but systems deal with action consequences and their related reproductions. Lifeworlds have components that are not differentiated temporally or spatially, while systems have components that are usually distinguished spatially and always distinguished temporally. Communicative action must take into account the positioning of participants within a known lifeworld in addition to action within a system, which limits the extent to which human behavior can be "systematized."

A system is a set of processes that allow for the coordination and reproduction of actions through functions, all of which exists in conscious or unconscious form within a lifeworld. Systems work *through* communicative action in the broadest sense of the concept, and are constituted, in part, by communicative *structures*. These structures are constantly claimed through communicative acts, and represents the infrastructure by which such acts allow for reproduction and variation in

systems over time. One of the primary goals of reconstructive analysis is to locate and explain the structures that underlie communicative acts, made difficult because these "[complex] constituting structures…are outside of space and time, which means that they are implicated tacitly and holistically rather than explicitly stated" (Carspecken, 1996, p. 107). These structures can be seen "as the medium and outcome of action. Structures do not determine actions, but rather enable them and are reproduced or modified as one of the action outcomes." (Zhang & Carspecken, 2013, p. 204).

In a design context, while we can potentially create a regressively-defined system of action (how a particular artifact came to be, reconstructively), we can never predictively define a system of behaviors in advance of communicative action in the context of an ultimate particular. In this way, systems may shape our behaviors in important ways, but can never completely discard the sense of lifeworld that is "drawn underneath" all of human action. In this study, I focus primarily on the structure and system level, without delving as deeply into the level of lifeworld, although many implications can be made in this direction.

Methodological Concepts

These methods of reconstructive analysis draw on the vocabulary presented above, and contain some of the intermediary steps needed to build a rich understanding of communicative acts located in observations or interviews. These methods serve as a "bridge" to developing an understanding of structures that underlie the system(s) being analyzed, allowing for a fuller conversation of system relations on the domain-specific level and beyond. In Figure 4, some of these theoretical concepts are linked together in a diagram, showing the relationship of multiple communicative acts to underlying roles, interactive settings, and typifications; underlying all of this are content inference structures, which will be explained in this section. This diagram represents a starting and ending point for multiple reconstructive methods, including meaning fields, validity horizons, and sequence analyses.

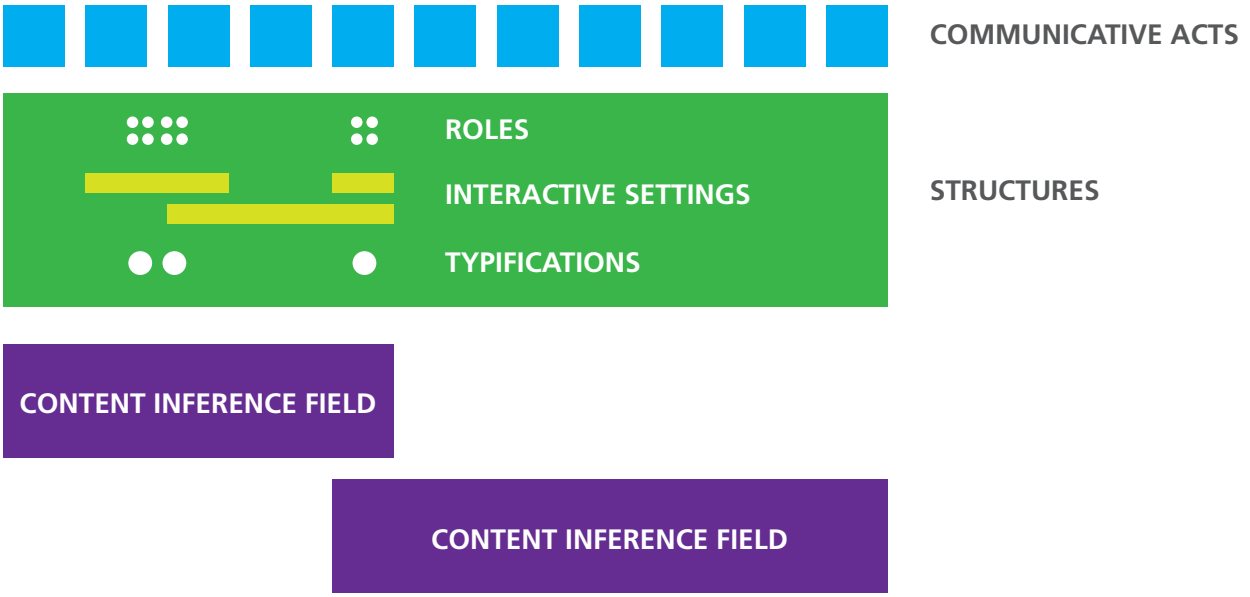


Figure 4. Relationship of Methodological and Theoretical Concepts.

Meaning Fields

In generating a *meaning field*, the goal is to explore possible meanings for a given communicative act—"meanings that other people in the setting might themselves infer, either overtly or tacitly" (Carspecken, 1996, p. 95). In this process, a bounded set of possible meanings for the given communicative act can be explored, not to determine the "true" meaning intended by the actor, but rather a paradigmatic set of meaning possibilities. The resulting meaning fields may not be an exact articulation of a field that the actor themself might generate, recognizing that, in an analytic sense, "meanings are always experienced as possibilities within a field of other possibilities (Carspecken, 1996, p. 96), and that actors may be largely unaware of portions of their meaning field.

Resulting meaning fields are a generative step in the reconstructive analysis process, identifying clusters of potential meanings, and their relationship to one another. Clusters are commonly related through logical "and," "or," "and/or," and "or/and" statements to demonstrate potential pairings of potential meanings, which can be more fully explored in the working out of a

validity horizon. To demonstrate this concept, I have developed a meaning field as an example, based loosely on a group meeting with students interacting around assigning tasks for a project with a mentor looking on:

Original speech act: "*I'll do the sketches—but if anyone else wants to…"*

"I really want to do this on my own"
(OR/AND)
"I'm being polite by offering the task to others"
(AND/OR)
"I can do the sketches better than anyone else"
[Possible psychological state: independent, confident, defiant]

(OR – split audience phenomenon)

TO MENTOR	**TO GROUP**
"I'm upset that no one in the group has offered to help" (OR/AND) "None of the group members are working hard enough" (AND/OR) "None of the group members can sketch very well" (AND/OR) "Someone in the group needs to help me" (AND/OR) "Thank you for bringing that topic up" (AND/OR) "I want someone to help me" [Possible psychological state: exasperated, overwhelmed, cry for help]	"I'm upset that none of you have offered to help" (OR/AND) "None of you are working hard enough" (AND/OR) "None of you can sketch very well" (AND/OR) "I want one of you to help me" [Possible psychological state: frustrated, incredulous, upset]

"I'm upset that no one else has offered to help"
(OR/AND)
"The rest of the group isn't working hard enough"
(AND/OR)
"The rest of the group can't sketch very well"
(AND/OR)
"Thank you for bringing that topic up"
(AND/OR)
"I want someone to help me"

As the example above demonstrates, this method is ideally suited to explore meaning-making beyond what can be directly observed or self-reported by participants. In this study,

meaning fields are used to explore ranges of potential meanings from several different perspectives, surfacing portions of conversations where deep, tacit meanings are frequently unstated yet important to the overall communicative process. Figure 5 visually depicts the interaction between analysis of a specific communicative act (including underlying understanding of setting, roles, typifications, and content inference field(s)), and the generation of a meaning field and validity horizon (see below). This figure also underscores the generative nature of these methods in informing changes to understandings of the setting infrastructure, relevant roles and typifications, and the underlying content inference field(s).

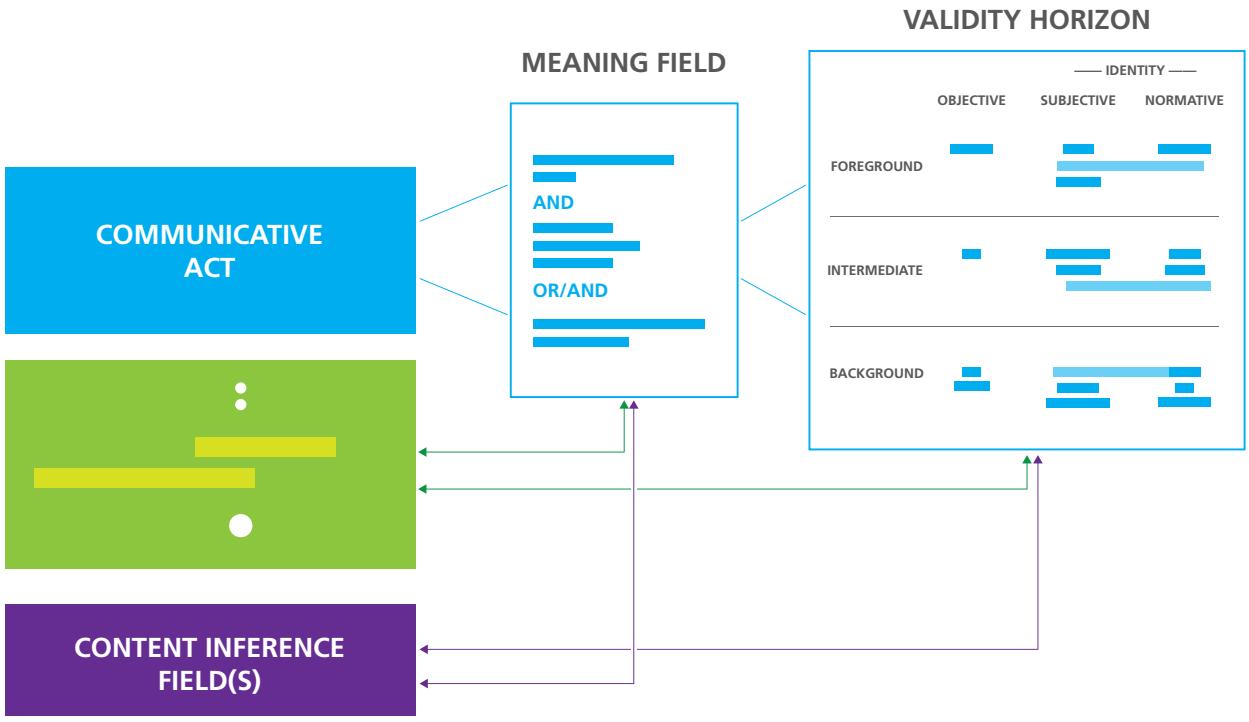


Figure 5. Relationship of Methodological Concepts in the Analysis of a Communicative Act.

Validity Horizons

Validity horizons build on the work done in creating a meaning field, exploring what validity claims from each of the three formal worlds (see above) must be instantiated in tacit or explicit

form for the given meaning to make sense. Zhang and Carspecken (2013) provide a fuller explanation of the purpose of this method:

> *The process of articulating 'validity horizons' in qualitative data analysis (Carspecken 1996) involves moving inferentially connected portions of the background of a meaning horizon into explicit articulation. It is a useful method for qualitative data analysis. However, the structures that are instantiated by meaningful acts have inferential implications that exceed even the tacit awareness of an actor. They can be discovered during the course of an interaction if one actor brings them to light so that another actor will be able to "see" them. They can also be noticed and articulated by an outside observer in ways that none of the actual participants have any awareness of (if the observer takes a performative position, i.e., is a virtual participant).* (p. 209)

In reconstructing the "inferential implications" of a given meaning, validity claims are produced—following the categories of objective, subjective, and normative, discussed above. Another special category of validity claim, an identity claim, may also be mapped in the validity horizon, which is a combination of a subjective and normative claim—something that is implicitly claimed as part of the identity of the person in a subjectively normative sense. All validity claims are then distributed along a continuum from highly foregrounded (i.e., likely to be immediately salient to the actors) to highly backgrounded (i.e., answers to the most baseline "why" questions). An example of this in Table 7, building on the meaning field generated above through a composite of several potential meanings, demonstrates how this method foregrounds implicit normative and identity claims about working in teams in relation to personal effort, while separating out multiple access and subjective claims that underlie these meanings:

Original speech act: "*I'll do the sketches—but if anyone else wants to…"*

Table 7: *Sample Validity Horizon*

	Objective	Subjective	Normative	Identity
Foreground	I am offering to do the sketches for the group	I'm upset because no one has offered to help I feel that none of you are working hard enough		

	Objective	Subjective	Normative	Identity
		I don't think any of you can sketch very well		
Intermediate	No one has offered to help me	I want to be helped I'm overwhelmed by the amount of work that has to be done	One of you should be offering to help with the sketches	I am a good and hard-working team member/student I am the kind of person that offers to do work when no one else does
Background	The team is distributing tasks The project includes the production of sketches	I believe that I should not have to do all of the work	Equality of task distribution in a team is good It's good to help others People should do their share / work benefitting a group of people should be shared by those people Team members should negotiate to distribute tasks The best person at a task should execute that task	I am a good person

Sequence Analysis and Settings

While meaning fields and validity horizons generally focus on the meaning of a specific communicative act or cluster of related acts, *sequence analysis* allows for a broader understanding of the interactive infrastructure, including how the conversation is shaped by the actors, what typifications and roles are used, and how settings are negotiated. Carspecken (1996) describes how this *setting* (also called an interactive setting) is created, modified, and sustained:

> *An interactive setting is a sort of normative infrastructure, tacitly consented to by all parties involved, that helps coordinate activities through giving a tacit specification of the basic purpose of the interaction, its rhythm, and the tacit agreement on associated values, norms, and/or beliefs. A setting negotiation occurs when one actor makes a bid to alter the*

> *normative infrastructure. A setting shift occurs when such negotiations succeed and a prior normative infrastructure is replaced by a new one.* (p. 116)

These setting negotiations, bids, and shifts often surround the taking on of roles by involved actors, which rely, often implicitly, on typifications that are consistent with the interactive setting. This method broadens the focus of the researcher, creating a detailed awareness of how meaning-making in discrete communicative acts are shaped by the normative infrastructure in which they appear. Settings are structure-phenomena in that they do not have existence in space and time, but are ongoing co-constructions that serve as a "medium and outcome of actions." *Sequence* deals with what an observer can see of actions in time; thus, interaction sequences can be observed to be static, with a beginning, middle, and end. Sample patterns that show a sequence and setting interacting might include conflict escalation, or a work/play pattern.

In this study, sequence analysis and terms related to the negotiation of settings are used to establish a broader, more comprehensive understanding of the complex situation in which the act arises, including relationships between actors, and how settings shift over time. This is especially powerful in the context of studio communication, where actors frequently slip in and out of conversations (due to proximity and/or interest); the goal of these interactions often changes over time as different actors lead successful setting bids, and the interaction is shaped by these shifts in conversation.

Content Inference Fields

Content inference fields are related to their locutionary content (i.e., the topics being discussed), and are related to, yet more stable than the interactional settings discussed above. "A content inference field cannot be freely constructed, created, or discarded by actors to the extent that illocutionary structures and norms of interaction can" (Zhang & Carspecken, 2013, p. 220). They act as structures that enable an actor to anticipate possible responses from other actors, as well as possible anticipations the other actors have of that actor's own anticipations with respect to them; in other words, these fields identify what kinds of responses an actor might feel are

appropriate from other actors based on a given communicative act as seen via multiple subject positions. These fields often intersect with illocutionary structures—such as setting structures, addressed earlier—but not always, and because of the very recent emergence of this construct, these lines are fuzzy and difficult to address based on the current literature. According to Zhang and Carspecken (2013), the sole example of this method or concept in use, participants can navigate within a given field by up-leveling, "articulating previously assumed principles, definitions, or truths in order to problematize them" (p. 220), or down-leveling, "ignoring unresolved issues of a certain generality in order to highlight more particular issues." (p. 221). In these movements, features of the larger content inference field can be mapped, and in conjunction with other methods like meaning field reconstruction and sequence/setting analysis, types of fields and their bounding characteristics can be more fully described.

This concept will be tentatively explored in chapter eight as a way of accounting for differing academic and proto-professional interpretations of pedagogical structures. One application of these fields explains how critique in informal settings as it differs from critique in formal settings allows for exploration of the larger academic and professional spaces in which these communicative acts reside.

Overview of This Dissertation

Using this framing of communication between students in a studio environment, I will explore the informal interactions between students, and the relationship of these interactions to the formal pedagogy in a specific graduate design program. In the next chapter, I will outline the methods that were used to investigate the research questions stated in chapter one, including ethnographic and critical perspectives and how they relate to the data collection process. Findings from the research will then follow in two main sections: chapters four, five, and six contain a narrative of the student experience of the design pedagogy, using multiple voices from students of different levels and from faculty to document the complexity of the interactional space, and to

provide a baseline understanding of the student's experience from which I can build deeper analysis of underlying structures; chapter seven includes a set of vignettes drawn from the larger narrative alongside reconstructive analysis of meaning, used to document and explore in greater depth the structures in place and informal interactions reveal how the students relate to the formal pedagogy. A discussion of system relations within this dataset, potential implications, and limitations of this research is included in chapter eight. In the final chapter, I provide concluding remarks and recommendations on directions for future research.

CHAPTER 3: METHODS

This critical ethnography was conducted in a naturalistic framing, employing a range of ethnographic methods (Carspecken, 1996; Madison, 2005), drawing heavily on a criticalist perspective (Habermas, 1984, 1987). A critical ethnography, sometimes referred to more simply as critical qualitative inquiry (Carspecken, 1996), springs from a critical epistemology. This epistemological stance can include issues of value orientation, although this is not necessarily always the focus of critical research. A critical epistemological orientation is based on "holistic, predifferentiated human experience and its relationship to the structures of communication" (Carspecken, 1996, p. 22), which is the core of producing a critical ethnography. As a researcher, I draw heavily on this criticalist perspective, while bringing in sets of methods from ethnography and the qualitative tradition.

An ethnographic approach was chosen for two reasons. First, ethnography provides a holistic view of a research site through a range of data collection methods. Because little is known about the occurrence and content of informal talk, including peer critique, in the design studio, broad, prolonged engagement with the research site allowed for a more complete documentation of practices. Second, ethnography as a way of knowing (Hakken, 1999) is well-suited to documenting cultural practices of the studio environment, providing not only a descriptive account of what activities occur, but also providing preliminary analytic explanations that include the relationships of cultural dynamics. As outlined in chapter two, relatively few ethnographies have been produced in the context of design education, and even fewer hold to the standards of rigor applied from anthropology and sociology in terms of prolonged engagement and use of participant observation and reflexivity in the process of fieldwork.

In the past century, limitations surrounding what can be studied in an ethnographic framing have evolved in the sociology and anthropology communities (Boellstorff, Nardi, Pearce, & Taylor, 2012; Marcus, 2009). This critical ethnography is not a classic Malinowskian ethnography in the

sense of a researcher interacting with a defined ethnic group or subgroup (Malinowski, 1922), but rather an intensive, prolonged investigation into a specific design studio, with special attention paid to interactions and talk between students. In the past two decades, the use of ethnography as a method and way of knowing has required a transition to less "traditional" sites, as has been indicated by Boellstorff et al. (2012) in the context of virtual worlds and Lassiter (2005) in a collaborative approach to studying intact subcultures. These non-traditional sites have required different methods of fieldwork and approaches than have been typical in ethnographies from past decades (Marcus, 2009). Ethnography, and critical ethnography in particular, is now considered alongside other qualitative methods as appropriate in social science research, defined broadly as a set of methods (Hammersley & Atkinson, 1995) or as an epistemology (Hakken, 1999), and was used in this study as a coherent, complementary set of methods to create a holistic account of informal interactions and student experience in a specific design studio environment.

Rationale for Selection of Ethnographic Site

The ethnographic site chosen for this study was the graduate design studio managed by the HCI/d program in the School of Informatics and Computing at Indiana University Bloomington. This academic program is part of the Department of Informatics and comprises approximately 75-85 Master's students in a two-year residential program, 12 PhD students, and six full-time faculty[2]. The space consists of several large work and collaboration areas, whiteboards, digital projection capabilities, and faculty offices. These spaces and collaboration equipment can be experienced to some extent through their documentation in Callison (2011).

[2] The sixth faculty member was hired during the data collection period, but did not officially join the department until the concluding month of data collection in December 2013.

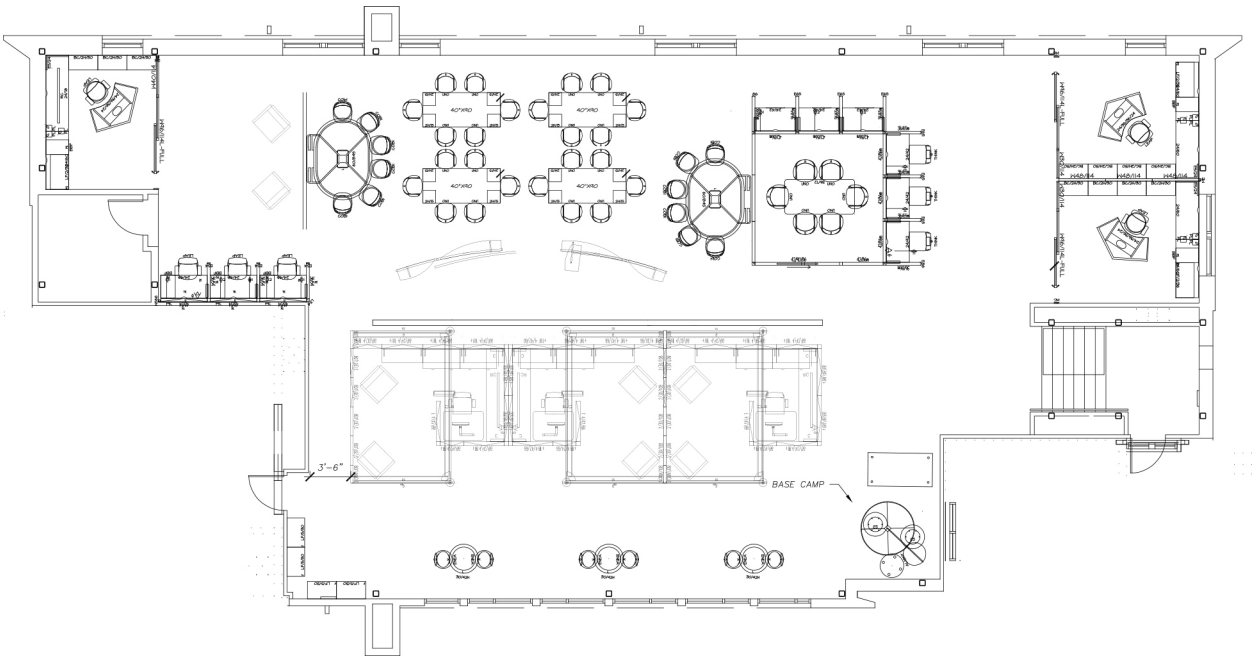
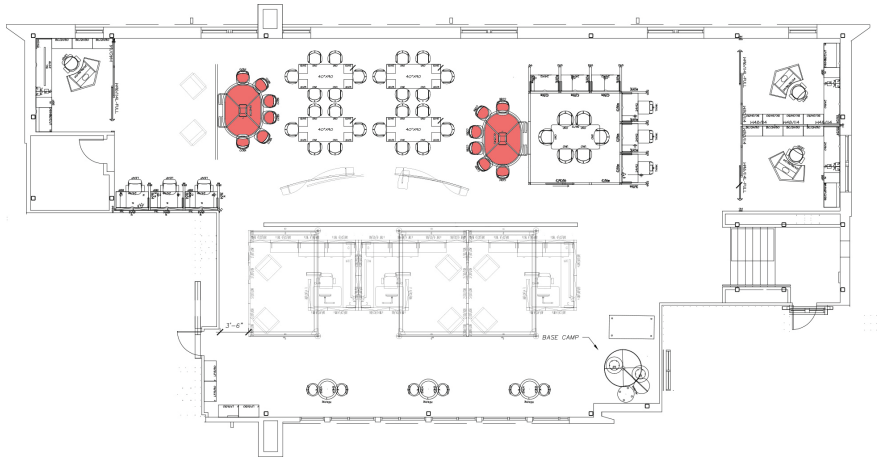
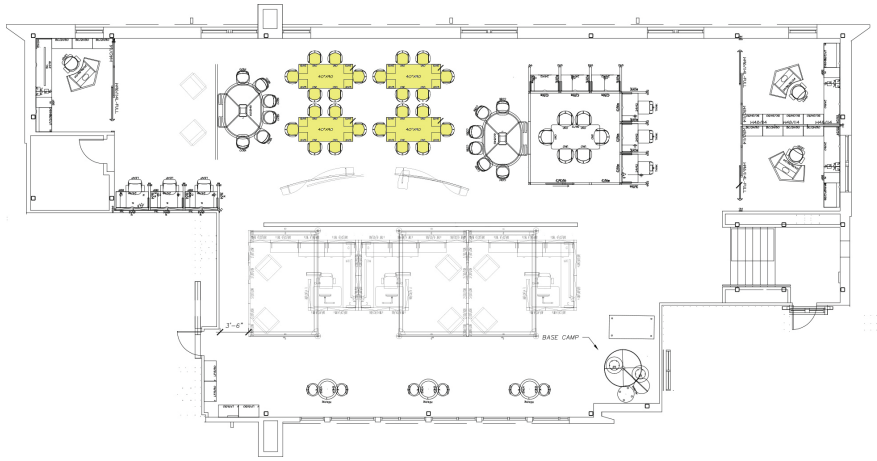
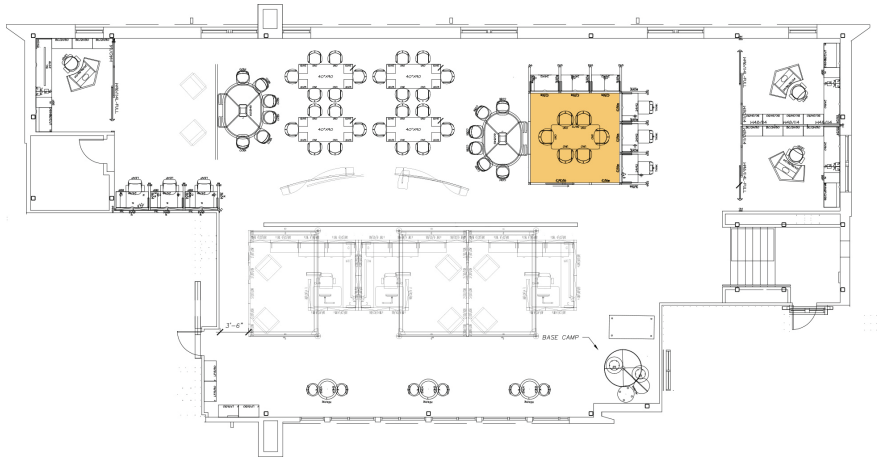
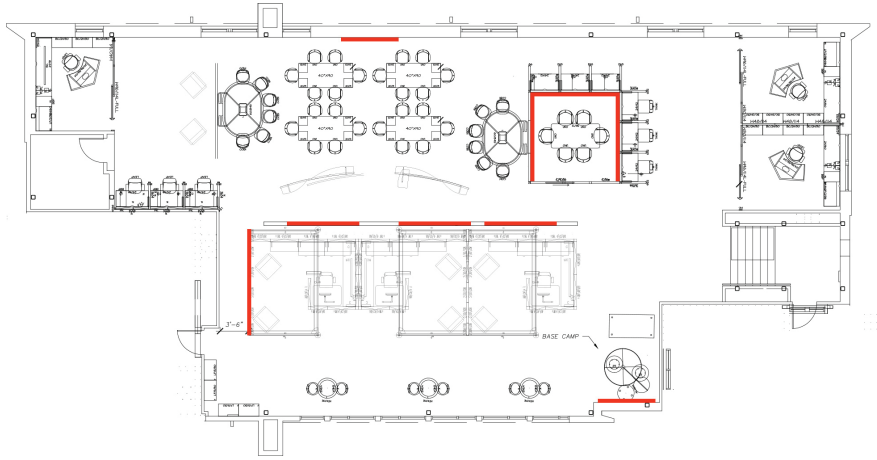


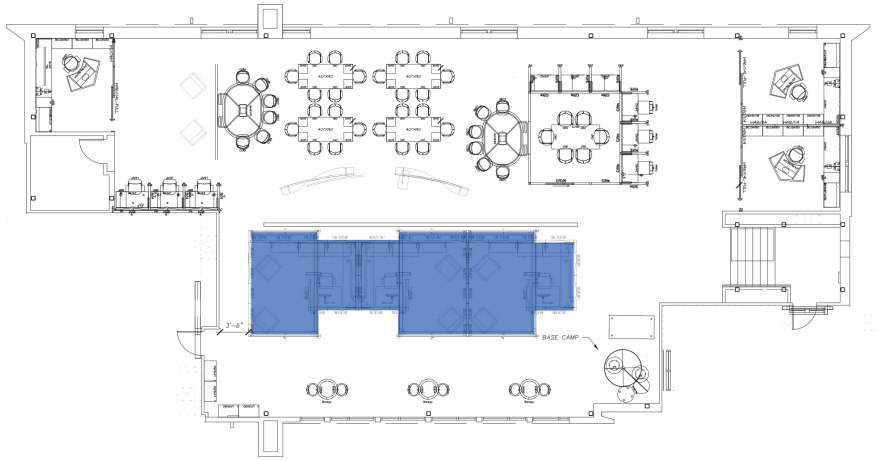
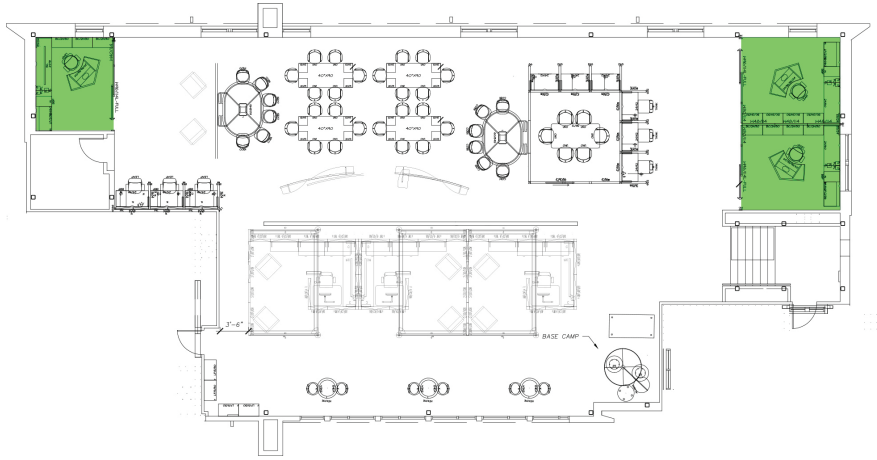
Figure 6. Architectural blueprint of the ethnographic site.

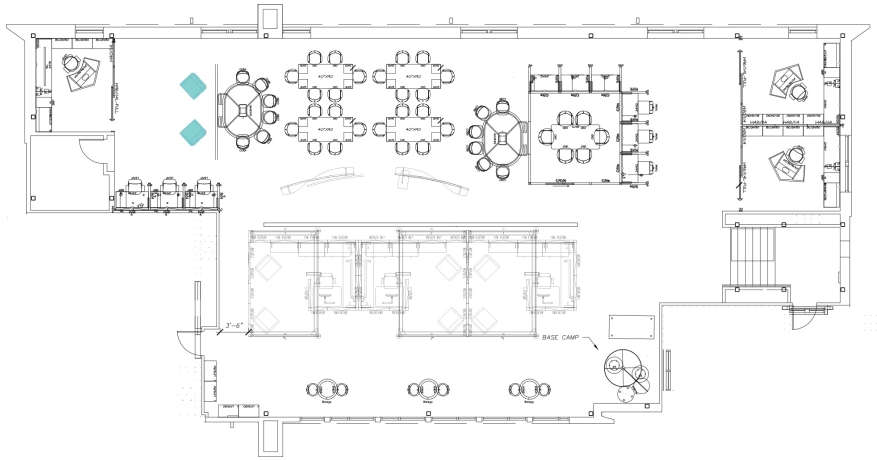
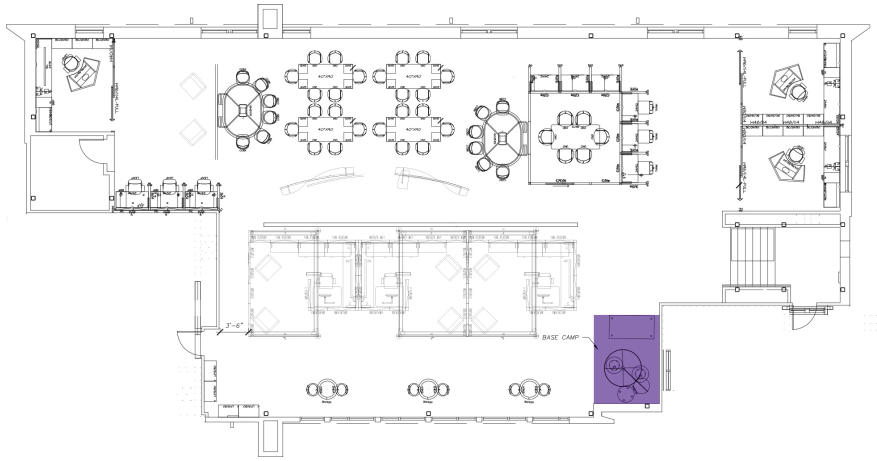
A blueprint of the space (Figure 6) reveals a large central collaboration area, comprising the main design space, with other areas for interaction available on the East, West, and South next to faculty offices. The main design space includes four worktables with six rolling chairs each, and two digital presentation tables with six tall rolling chairs surrounding a large TV with laptop inputs. The space also includes four large whiteboards and one portable whiteboard in the main design space, a fully "writeable" room with glass doors and whiteboard wall surfaces known colloquially as the "fishbowl," along with numerous writeable surfaces throughout the rest of the space. A fuller description of the areas for interaction are provided in Table 8 on the following pages, including: presentation tables and work tables in the main studio space, the "fishbowl," whiteboards, open and closed faculty offices, study carrels, soft seating, a couch seating area, and small tables in the south hallway.

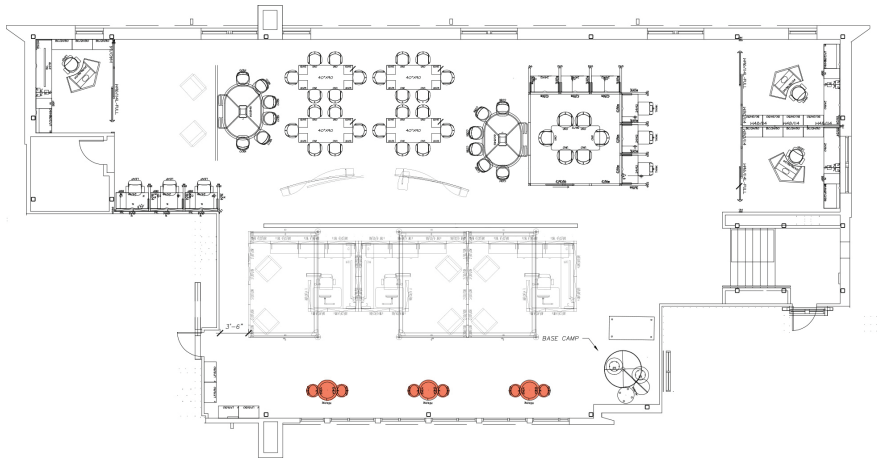
Table 8: *Primary Areas for Interaction in the Design Studio*

Area	Photo of Area in Use	Blueprint Location
Presentation Tables		
Work Tables		

Area	Photo of Area in Use	Blueprint Location
"Fishbowl" whiteboard room		
Whiteboards		

Area	Photo of Area in Use	Blueprint Location
Open, "nautilus-style" faculty offices		
Closed faculty offices with privacy film		
Study carrels		

Area	Photo of Area in Use	Blueprint Location
Soft seating, including chairs and bean bags		
Couch collaboration area		

Area	Photo of Area in Use	Blueprint Location
South hallway tables		

Data Collection Procedures

The study includes descriptive and analytic components, relying on a range of ethnographic methods, including: participant observation, classroom observations, semi-structured interviews, reflections, and artifact analysis. Table 9 summarizes the data collected during the Spring 2013 and Fall 2013 semesters.

Table 9: *Summary of Data Collection Sources by Type and Period of Their Collection*

	Spring 2013	Fall 2013
Participant Observations	150 hours of field work, exclusively in the design studio, documented through a field note record	301 hours of field work, comprising the studio, classroom instruction, and other social interactions. 165 hours of this field work was primarily observational with little participation in the classroom. All data were documented through a field note record.
Audio Recordings	150 audio recording segments from field observations, comprising 45 hours of data	395 audio recording segments from field observations, comprising 231 hours of data
Photographs/Videos	745 photos of studio interactions, whiteboard sketches, and placement of objects	2780 photos or videos of studio interactions, classroom interactions, whiteboard sketches, and other objects present in the studio space
Interviews	13 interviews, including members of the 2013 and 2014 cohorts and PhD students from two different programs	17 interviews, including members of the 2014 and 2015 cohorts and a PhD student from one program. Three interviewees were also interviewed in the previous semester.

	Spring 2013	Fall 2013
Faculty Reflections		4 faculty members participated, with a total of 19 reflections collected via email or short interview. 1 faculty member was only able to participate in an interview at the conclusion of the semester.

Participant Observation

I observed the studio space using participant observation techniques for approximately 150 hours during the Spring 2013 semester, followed by an additional 136 hours during the Fall 2013 semester. Each semester, I determined the total number of participant observation hours based on my availability as a researcher, the presence of students in the studio space, and the perceived saturation of types of interactions being observed. Students were notified by email that the studio space was under observation during both semesters of data collection (Appendix B).

Each semester of an academic program can be seen as unique, with different courses offered, and placement at different times of the year. While I sought to achieve saturation of interactions in each semester of data collection, the qualities of interactions, especially in relationship to the cohorts of students and the coursework being offered, differed dramatically between the two semesters of data collection. During the Fall 2013 semester, a new cohort of students (2015 cohort) began the Master's program, while the first-year students (2014 cohort) that were observed in the Spring 2013 semester were promoted to second-year status. Through these two semesters of data collection, I was able to reconstruct interactions from a mature, familiar set of cohorts leading to graduation (2013 and 2014 cohorts), as well as the construction of a new cohort (2015 cohort), which includes the forging of social and professional relationships and the emergence of a unique studio culture based on cohort composition.

Field Notes

In both semesters, I used handwritten field notes produced in the field as the primary data collection method (see Figure 7 as an example), supplemented by audio recordings of interactions perceived to be salient and photographs of whiteboard sketches, design artifacts, positioning of students, and other temporal elements of the space. Handwritten field notes identified information perceived as relevant in a given observation, and included: 1) site sketches identifying individuals and locations of salient objects/artifacts; 2) ingress and egress of individuals in the space; 3) perceived types of interactions based on content of discussion; 4) quotations of speech acts and associated paralinguistics; and 5) annotations of accompanying audio recordings and/or photographs.

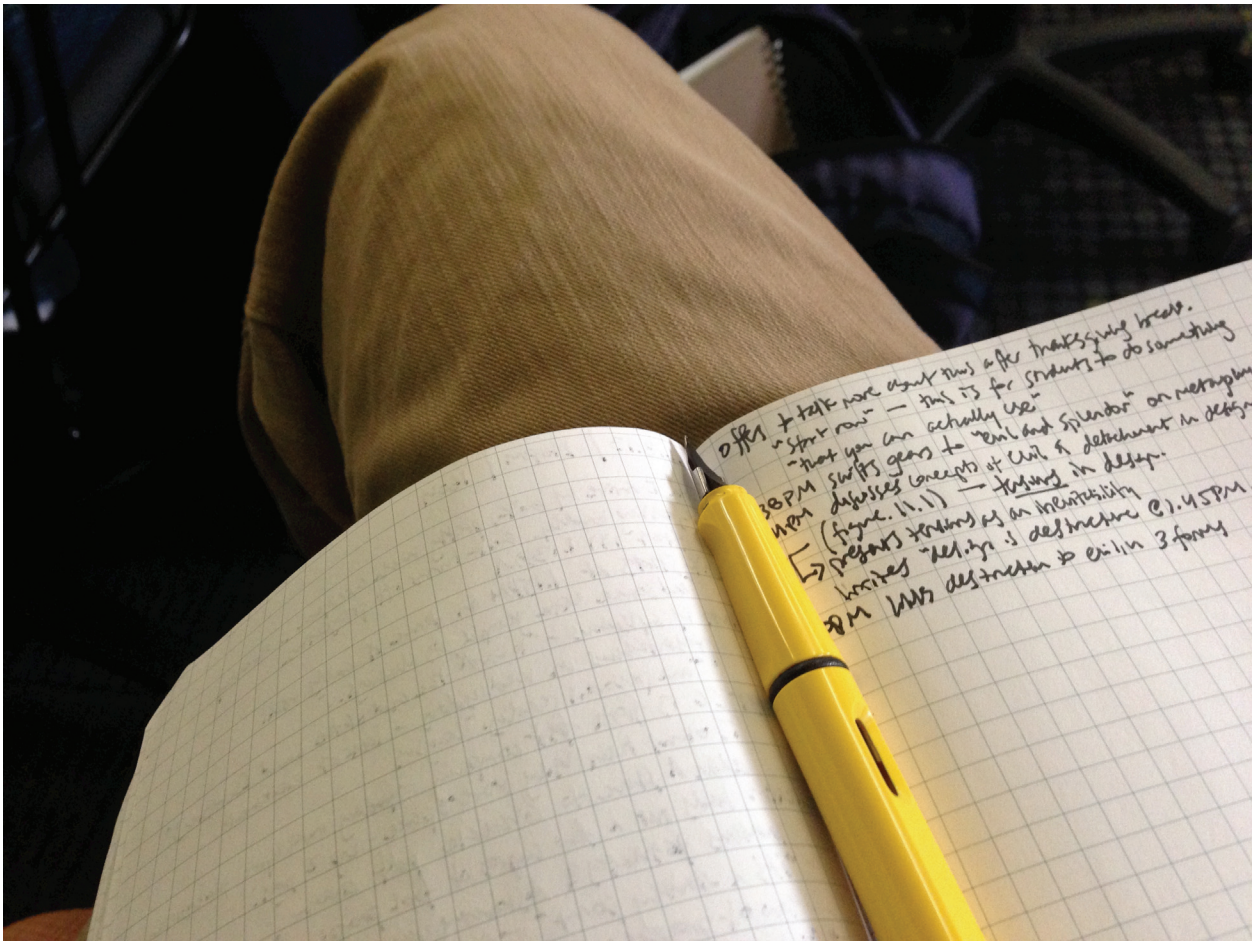


Figure 7. Sample field note during a classroom observation session.

Collection Strategies

Because the ethnographic site was often busy, containing numerous active participants, I was not able to document every interaction with precision. In response to this limitation, I altered my position in the studio for each participant observation session (see Appendix C for locations of each observation session) to allow for a different vantage point, and also to avoid displaying any territorial tendencies or unknowingly violating the preferred working space of other student on a consistent basis (Modell & Gray, 2011). I moved throughout the entire studio space, including hallways and other collaboration areas outside the main work area on at least an hourly basis, documenting interactions that occurred in other locations peripheral to the primary work area. I focused my observations on interactions that appeared relevant to the guiding research questions of this study, and the salience of these interactions in relation to design projects, coursework, or other objects that are discussed in a critical framing.

I also relied on a method of "priority observation" (Carspecken, 1996) to foreground certain interactions and background others. Using this method, I observed the general characteristics of the room and any relevant contextual details as I began each session. Based on these observed characteristics and participants, I chose an interaction, person, or part of the room to focus on, taking field notes, audio recordings, and/or photographs primarily in relation to that priority. As Carspecken (1996) notes:

> *I take one person in the setting and record everything that person does and says as thickly as possible as a first priority. I record everything other people do and say in interaction with this person as a second priority, and I record everything else happening in the setting as a third priority* (pp. 48-49).

This technique integrated with my regular movements around the space, on approximately an hourly basis. This movement allowed me to generalize my surroundings once again, and to select another "priority person" or interaction, or to continue with the previously selected priority. Over extended observation across dozens of sessions, I was able to select a wide range of priorities to

observe, allowing for detailed data collection on a wide range of interactions from a broad cross-section of the studio participants.

Audio Recordings

Audio recordings were made of interactions perceived to be salient for a number of potential reasons: 1) group conversations that were salient because of subject matter and/or conversational style; 2) conversations between the researcher and participant(s) to supplement interview data in triangulating intentions and meaning-making; and 3) interactions where the researcher was playing an active participatory role, and was unable to document interactions through field notes as thoroughly as during less active moments of participant observation. During the Spring 2013 semester, most recordings were intended to document designerly talk of some sort. In the Fall 2013 semester, most students—with a substantial number new to the program—were much more naïve in their interactions, with less explicit designerly talk occurring, so recordings during this semester were much more diverse in content and perceived salience. All recordings were captured on the researcher's Apple iPhone 5 to allow for more natural interaction with participants; these timestamped recordings were made through the built-in Voice Memos application during the Spring 2013 semester, and through the Audio Memos application during the Fall 2013 semester. While many participants were aware that I was audio recording studio interactions through informal conversations or materials documenting the study that had been emailed to them at the beginning of the semester, I did not notify them when I started or stopped recordings during the participant observations.

To facilitate further analysis and recall, I also created an audio log, documenting the audio recording start and stop times, the related participant observation field note, and a brief description of the contents and actors contained in the audio recording. If at all possible, this data was recorded in the field using a Google Spreadsheet, with references to the start and stop times placed directly in the handwritten field notes.

Photographs

Photographs also supplemented the field note record and audio recordings, documenting the positioning of individuals or objects in the space, student use of whiteboards and/or markings in the space, references to artifacts shown on paper, laptops, phones, or tablets, or the general activities/experience of the space during a given day. All photographs were captured on the researcher's Apple iPhone 5, which included GPS tagging of the location and a timestamp, allowing for triangulation with other data sources during analysis.

Researcher as Participant

I assumed a range of participant roles in the space as would be appropriate for a student working in the studio, including: 1) detached observation ("fly-on-the-wall") with no explicit verbal or participatory action; 2) minimal participation, including responding to greetings and direct questions, but not commencing or leading conversations; and 3) full participation, which included commencing conversations, conversing in a leading or guiding way in what I perceived to be a typical student role. The student role I took on was based on a composite of multiple typifications of students at differing levels, with my understanding of each typification in relation to the program at large coming from my experience in the department. Because of the composite nature of the role I took on, I chose to explicitly foreground certain typifications when speaking to specific groups of students (e.g., collegial and collaborative peer with second year students, mentor-like professional with first-year students) in order to gain insider status into multiple groups. In none of these experiences did I seek to fully "other" myself as a non-designer, completely without knowledge of the program or field; I also did not attempt to present myself as having a position of power (e.g., faculty member, evaluator), even though some students assumed that I might, due to my close interactions with some of the program faculty.

The three perspectives of participant observation I mentioned previously were used interchangeably and in a reflexive manner (see Reflexivity below) as approaches to describe and

analyze activities in the space. As I became more familiar with the norms of the studio environment in these particular semesters, I was able to participate more fully, generally seen by the participants in the space as an "insider" (see Figure 8). My process of becoming an insider was relatively quick during the Spring 2013 semester, since the majority of the students already knew me through previous classroom interactions as a mentor or fellow classmate. The process was much longer and more varied in the Fall 2013 semester, as I was unknown to almost any of the incoming cohort except as a researcher; I was able to reach insider status with a number of the students from this new cohort over time, allowing for greater levels of participation, but I was not fully accepted by all students in this manner, with some students merely tolerating my presence.

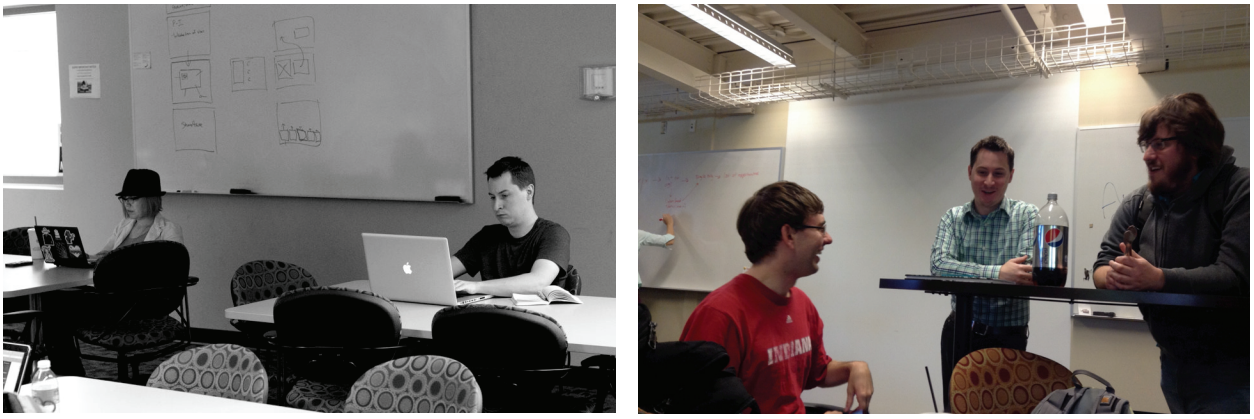


Figure 8. Differing modes of participation (Photos from Facebook or provided by students).

Particularly in the early part of the Fall 2013 semester, I used a detached mode of participation, escalating to higher levels of participation only if encouraged or invited by participants in the space. As I became more comfortable with the norms of the space as enacted by the new participants, I used this minimal participation as a baseline, with instances of full participation either by invitation, or when it felt socially appropriate to respond. In this latter case, an interventionist approach—instigating an interaction—was used on occasion to attempt to establish a role in the space as a fellow participant, which the participants in the space variously either validated or dismissed.

In order to take advantage of the reflexive position of the researcher, this flexible view of participation in the social space was critical. As Hammersley and Atkinson (1995) note, "Once we abandon the idea that the social character of research can be standardized out or avoided by becoming a 'fly on the wall' or a 'full participant', the role of the researcher as active participant in the research process becomes clear. He or she is the research instrument par excellence." (p. 19). The implications of an active participatory role on the part of the researcher to the overall validity of data collected will be discussed in the Methodological Issues section of this chapter.

Classroom Observation and Faculty Reflection

During the Fall 2013 semester, I observed classroom instruction for all of the core courses offered to first- and second-year Master's students. Solicitations were sent out in August 2013 to the four professors who taught courses in the program that semester (see Appendix B); all faculty agreed to have their classes observed and were included in this portion of the study. In total, I attended five courses taught by four professors, including 68 class sessions totaling approximately 133 hours of contact time. A full listing of the courses observed and the frequency for each is available in the observation log (see Appendix C).

Unlike the studio observations, where I played the role of participant observer, my role was primarily that of an observer in the classroom setting. My goal was to disrupt the classroom instruction as little as possible, and this affected the type of data I was able to collect, as well as my impact on the classroom. I did not participate in any direct way in these courses, by answering questions or talking with students or professors. In general, I took audio recordings of classroom activities to supplement my field notes, but took very few photos or videos, as it had the potential to disrupt students or the professor. Where possible, I changed position in the classroom, attempting to get multiple perspectives on the instructional experience; this was especially true in studio-oriented courses (e.g., prototyping, rapid design, some design theory sessions) where students met in smaller groups or interacted in a non-lecture format.

In addition to these classroom observations, I requested that the faculty in the courses I observed complete a bi-weekly reflection or brief interview, capturing their goals for instruction, and their perceived sense of student progress (see Appendix D). These reflections were used to triangulate data collected during classroom observations and references to coursework by students in the studio environment, as well as revealing portions of the intended pedagogical and epistemological structures of the studio. All four professors participated in this reflective process to some degree, but with differing levels of completion over time. Two professors completed seven reflections each, choosing to participate in a short interview to discuss their courses. Another professor completed four email reflections in the first half of the Fall 2013 semester. The fourth professor was unable to participate during the semester, but participated in a one-hour interview at the conclusion of the semester.

Interviews

Interviewing is a critical part of performing fieldwork (Madison, 2005), and moves beyond viewing the interviewee as "an object" to viewing the interviewee "as a subject with agency, history, and his or her own idiosyncratic command of a story." (p. 25). Madison (2005) presents three forms of ethnographic interview: oral history, personal narrative, and topical interview. I used personal narrative to allow the interviewee to share their impressions or perspective on interactions I observed in the design space. Topical interviewing was used to stimulate expression of beliefs about critique and conceptions of design in more general, structural ways. This form of interviewing complemented my understanding of specific interactions that were observed in the design space, allowing me to document other perspectives on these interactions by the interview participant in a more reflective way.

The interview protocol used in this study (see Appendix E) was constructed using Carspecken's (1996) structure of topic domains, lead-off questions, possible follow-up questions, and covert categories. The lead-off questions are designed to begin an exploration into a topic

domain, starting in concrete terms, and moving into more abstract, tacit structures through the use of follow-up questions. Covert categories address "items that you wish your subject to address during her talk but that you do not want to ask explicitly about because that could lead the interview too much." (Carspecken, 1996, p. 157). I used a range of responses, as indicated by Carspecken (1996, based on Kagan, 1980) in his typology, including: bland encouragements, low-inference paraphrasing, non-leading leads, active listening, medium-inference paraphrasing, and high inference paraphrasing. In general terms, I used higher-inference responses later in the interview process, as the interviewee became more comfortable and I was able to anticipate their responses in medium-inference paraphrasing. The clarification and concrete detail provided by interviewees provided a basis for me to craft appropriate, yet higher-inference, follow-up questions.

In parallel with my participant observation of the design studio, I solicited students by email (see Appendix B) to participate in an interview; these individuals were selected based on their activity in the space or through other indications from the data (e.g., their lack of presence in the space; their involvement in activities documented on Facebook). Students were notified that I was observing the design studio space through an email sent by one of the professors to established student listservs in January 2013 and August 2013 (see Appendix B), and many students seemed anxious to be selected to tell their story and participate in the project in this way. Students were offered a $10 gift card for their participation in an interview, and the students were able to discontinue their participation at any time. All students who expressed interest after being emailed completed the interview process.

The interviews were intended to serve as a form of dialogical data collection (see Stage Three of analysis, below), triangulating my observations in the studio and classroom, and allowing the student to expand on their beliefs about critique, their interactions in the studio, the relationship of the formal pedagogy to their interactions with students and the professional design community, and other related topics. During the Spring 2013 semester, I used the interview

protocol more directly, with most questions relating directly to structures of critique and communication. By this point in the academic year, students were familiar with critique and comfortable talking about design and their design process using these "designerly" words. During the Fall 2013 semester, I used a less structured interview approach, still drawing heavily on the covert categories and follow-up questions, but asking broader questions about the perceived academic progress and conception of design thinking, in addition to any interactions in the design studio that I observed during participant observations (see Appendix C). Many of the new students in the Fall 2013 semester did not yet feel comfortable with critique and other related design vocabulary, except in a limited, stereotyped way; thus, these interviews relied more on establishing narratives of initiation into the program, their personal experience of key events during the semester, and their comfort with participating in critique.

Secondary Data Sources

Several secondary data sources were collected in parallel with the primary data from the same general student population (Table 10). While these sources were not directly analyzed as part of this dissertation, they were used in a minor way to triangulate observed interactions, provide background details on conversations that had some online/virtual component, or to provide background information on informants who participated in data collection during a summer internship. These sources have been analyzed in more detail in other research publications, explaining how students formed proto-professional design conversations in virtual spaces (Gray & Howard, 2014), participated in critique of each others' work (Gray & Howard, 2013), and built their identities as designers in relation to the professional design community as they developed competence (Gray, 2014). While each of these publications foreground specific analytic framings and sources of data (e.g., identity development, online critique), I will not attempt to directly use these framings in this dissertation. Relevant portions of the analysis and findings will be included as they relate to the research questions of this dissertation.

Table 10: *Summary of Secondary Data Collection Sources*

	Description of Data Source
Facebook Groups	Posts and comments from a set of 11 student-created Facebook groups. The dataset comprises 22,254 comments and 7,491 status updates as of January 31, 2014.
Competence Survey	111 survey responses from 11 student participants (from 2013 and 2014 cohorts) over a 12-week data collection period
Competence Interviews	23 interviews were conducted with 10 student participants to augment the survey data collection (above)

Facebook Groups

The current set of Facebook groups began as one group, created by a cohort of students (2012 cohort) in the Master's program in 2010. This single group grew in size and use over time, expanding into a system of groups, including: four cohort groups (for the 2012, 2013, 2014, and 2015 Master's cohorts), a group for all currently enrolled students ("current years"), and a group containing current students and alumni ("all years"). In addition, multiple topical groups have been created as needed or desired by students, including: HCI Memes, "Let's Talk Davidnese," Mad Skillz Club, Natural Interaction, and a job board managed by alumni. Program faculty have joined many of these groups, but their participation is infrequent and not construed as part of the formal pedagogy by students.

I used a custom PHP script to download all status updates, comments, and associated data from 11 groups through the Facebook API. All downloaded data was processed and stored in a MySQL database, which allowed for future offline access and coding. This data represents all group interactions up to January 31st, 2014, and includes: 7,491 status updates and 22,254 corresponding comments. All data are linked to the primary data sources, described above, through individual identifiers (e.g., names) and timestamps. Additional analysis of this dataset in relation to critique and emergent definitions of designerly talk have been completed (Gray & Howard, 2013; 2014).

Competence Survey and Interviews

11 students from the 2013 and 2014 cohorts were recruited for a related research project (Gray, 2014), documenting perceptions of competence as these students entered the workforce or completed a professional internship. These participants were first (n=6) and second (n=5) year students at the time of their participation, and were recruited through an email solicitation. 10 of the 11 participants completed the data collection period.

These students took part in two primary methods of data collection: weekly surveys and monthly interviews. I requested that all participants complete an online survey for 12 weeks, commencing at the same approximate time as their new job or internship. For students completing internships, the data collection period included the entire internship. The survey instrument included several quantitative questions to track the students' perceived level of competence over the data collection period, with additional open-ended follow-up questions regarding the relationship of their perceived competence to their everyday design activity, sharing of knowledge, and relevance of the program pedagogy to their work.

In addition to the weekly surveys, I requested an interview from each participant at one-month intervals. This additional data source allowed me to triangulate the narrative account of the participant's work setting and practices with their survey submission, painting a fuller picture of each student/practitioner's experience. Through these interviews, I was also able to identify issues that may have affected their competence ratings, and discuss them further with the participant. Prior to the final interview, I collected all quantitative responses into a graph, using it as a tool to discuss perceptions of competence over the entire data collection period.

Data Analysis Procedures

I will describe the procedures by which I analyzed the data sources mentioned above, situating the information presented in the next four chapters. In the previous chapter, I set out a number of conceptual and methodological definitions important to understanding the critical

dimension of my analysis, including terminology relating to Habermas' framing of communicative action and several processes common within reconstructive analysis. In this section, I present my analytic process through a five-stage framework suggested by Carspecken (1996) for critical ethnographies.

As mentioned earlier in the chapter, I explicitly take a criticalist stance in my research, often importing a value orientation that corresponds with that stance—characterized by an emancipation of students, empowering them to "become more fully human" (Freire, 1970/2000, p. 55), and a critique of existing power and other system structures within this framing. I do not attempt to represent myself as a researcher, or the artifacts or processes that build on the data I have collected, as immune or separate from this value orientation, but rather seek to disclose as much of my personal perspective as possible, using multiple methods of validation to bring in alternate voices and readings of the data.

1. Building the Primary Record

The primary record is primarily monological in nature—speaking with only the researcher's voice (Carspecken, 1996, p. 42). This is done to minimize the effect of the researcher on the ethnographic site (see Methodological Issues, below), and to provide an initially passive account—primarily an outsider perspective, although still drawing on the researcher's lived experience. In this study, the primary record was built with participant observation field notes as a starting point. These notes are considered to be the focus and document of record in this study, with all other data sources related by date, interaction, or participant in some way.

Digitizing Field Notes

I produced typed field notes from my handwritten field notes shortly after I completed each data collection period. As part of the archival process, I converted each physical record into a PDF file, and then used this file to produce the digital record, leaving any site diagrams or visual representations easily accessible in digital form. This digitization process—of both text and

images—functioned as both a mechanical translation of the field notes from analog to digital form, and as a way for me to actively reflect on the handwritten field notes *vis-à-vis* my perceived experience in the field, as a simulated recall of what I had just experienced. This process also facilitated the creation of a richer, more complete account of the observed interactions as I experienced it, including details that were unintentionally left out of the handwritten account—due to lack of time or contextual distance—but still remained as "headnotes"(Emerson, Fretz, & Shaw, 2011) in my memory, as stimulated by the physical field note. I often used this process to reflect on the roles of individuals, structures, and the system at large, which directly informed future observations (see Reflexivity, below). The creation of this digital record also simplified the analysis of participant observations, and made direct coding of field notes possible.

Creating a "Thick Record"

Due to the scope and duration of data collection, not all field notes were expanded to the same degree. All notes were digitized (see above), with the components of a thick record as noted by Carspecken (1996) included: speech acts, body movements, and body postures; use of low-inference vocabulary; frequent recording of time; use of brackets as needed to indicate higher-inference researcher commentary; inclusion of the context of each observation; verbatim speech acts formatted in italics; and the presence of site diagrams. When included in reconstructive analysis, the term "interaction" is applied as a basic unit of analysis, describing a coherent set of observable behaviors between an individual and the studio environment and/or between multiple individuals.

2. Preliminary Reconstructive Analysis

To begin the reconstructive process, I engaged in strip analysis (Carspecken, 1991 citing Agar, 1986) of the field note data, noting trends in types of interactions through multiple readings alongside interaction in the studio space. Strip analysis involves the externalization of preliminary working hypotheses on the part of the researcher about the tacit constructions that allow meaning-

making and interaction to occur, so that they can be tested and validated through additional participant observation. This form of analysis developed over time through reflections on the activities I was observing, and affected how I took my notes, including trends that I foregrounded in additional observations and field notes. Carspecken (1991) explains his use of strip analysis in a large-scale study of school activists, which bears significant resemblance to my own approach:

> *…the examination of consistencies in my ethnographic notes and the construction of tacit cultural frameworks in order to explain them. My conclusions…were checked by looking for consistencies in the field notebooks and through interviews with the relevant activists which elicited their own interpretation of the vents. Strips of action in this course could be consistently predicted once I formulated the tacit schemes. Moreover, I found the activists themselves formulated versions of the schemes when conditions within the school altered in debates force them to articulate what had formerly been unnoticed and taken for granted.* (p. 203).

Once these preliminary hypotheses were externalized and validated through expansion or refutation by participants during interviews or observations, they were then addressed in a more comprehensive way through formal reconstructive analysis of several vignettes perceived to be important in describing main points of the narrative (see chapter seven). I identified these vignettes after multiple readings of the field notes in chronological order, and by viewing other documentary evidence (e.g., Facebook threads, photographs) in a similar way. Based on these multiple close readings, and the notes I generated surrounding critical narrative events or "peaks," I discovered multiple stakeholders or groups in the program that had differing accounts and perspectives; to account for this complexity, I identified three "voices"— first years, second years, and professors— and constructed narrative arcs for each, which are described in rich detail in chapters five and six. With these narrative arcs and voices constructed, I selected five pivotal events, or "vignettes," from the two semesters of data that appeared to represent the complexity of the overall environment, or ones that piqued my interest because so many other activities or events hinged upon them. Other factors that I used to select these vignettes included: the range of observed interactions, my discovery of how virtual and physical spaces were integrated in these interactions (which will be discussed later), and the relationship of each voice to the formal pedagogy and student experience.

Each vignette was then documented thoroughly through the construction of thick field notes (see above) and explored through a relevant set of reconstructive techniques. These vignettes were coded for additional behaviors, meaning fields, validity horizons, and other common methods used for critical analysis of data (discussed in chapter two). Sequence analysis and other constructions of meaning were also used to analyze the data and structure the findings in final written form. This reconstructive framing of analysis can best be described as follows by Carspecken (1996):

> *The analysis is reconstructive because it articulates those cultural themes and system factors that are not observable and that are usually unarticulated by the actors themselves. Putting previously unarticulated factors into linguistic representation is" reconstructive": it takes conditions of action constructed by people on nondiscursive levels of awareness and reconstructs them linguistically. Reconstructive analysis always contains an element of uncertainty, or indeterminacy, but boundaries exist on the possibilities, boundaries that the researcher must discover and elucidate.* (p. 42)

In other words, this reconstructive work sought not only to rigorously document what occurred in these interactions, but also what structures and cultural or systemic features were indicated, and the relationship of actors and pedagogy to these mechanisms.

After the initial reconstructive analysis was complete, all phase two materials were evaluated by a second researcher familiar with the research site and data analysis procedures used in this study. This researcher was a doctoral student who had previously graduated from this HCI/d program, and had extensive lived experience in the coursework and studio environment. I addressed and supported areas of potential weakness as observed by this researcher through examples from participant observation, interview, or secondary data, and through this conversation, the meaning reconstructions were altered as needed.

3. Dialogical Data Generation

I used two main periods of interviews with participants—one in the Spring 2013 semester and another in the Fall 2013 semester—to expand upon, verify, and "challenge information collected in stage one and analyzed in stage two" (Carspecken, 1996, p. 42). These interviews were intended to augment my understanding of the social phenomena I was observing in studio

and classroom settings, and since my goal was to represent the student voice in a substantive way, this was also a way I sought to "democratize the research process" (Carspecken, 1996, p. 42) and give students a space to express their feelings and experiences. It is important to note that the goal of these interviews is somewhat different in the critical ethnography tradition as compared to qualitative research at large; according to Carspecken (1996), the goal in this stage is to allow for "generat[ion of] data with people rather than record[ing] information about them" (p. 42), joining the participant into the task of understanding experience and making sense of it within the larger educational and professional system.

To accomplish these goals, several individuals were interviewed multiple times (Appendix F), especially when the secondary data source competency interviews are brought into consideration. Four individuals were interviewed once in each semester (totaling two interviews), and two other individuals were interviewed during the summer as part of the competency study as well. As a whole, these interviews were used to check for consistency of things that were observed, to clarify remarks of other participants, and to establish a baseline of experience so that features of the larger educational or professional system could be discussed in more detail. A fuller explanation of the interview protocol and strategies used are discussed above (see Interviews).

While no explicit focus groups were conducted, several conversations that directly related to the topics under consideration in this dissertation occurred organically during regular studio observations. I used these opportunities to ask questions, sometimes instigating discussion of topics related to my interests, and in other cases continuing a conversation already in progress. While these focus groups had certain limitations of time and structure due to their lack of organization, they were nonetheless beneficial in challenging many of my assumptions about the various "voices" in the program, and provided me with additional leads (both online and physical) to investigate further.

4. Systems Relations

In this stage, I addressed the findings from this specific design program in relation to other understandings of studio culture, theoretical models of the studio, and prevailing notions of the relationship between academic and practice communities of designers. A fuller account of these relations are explored through the concept of *content inference fields* in chapter eight.

5. System Relations to Explain Findings

Because of the scale and single-site nature of this study, larger system relations can only be hinted at, especially due to the lack of comprehensive exploration of social theory in relation to design education. In the process of addressing system relations vis-à-vis other theoretical models of the studio in Phase 4, additional implications are suggestive for the broader space of professional design education. A limited discussion of these potential system relations on a larger scale are discussed in chapter eight.

Methodological Issues

Threats to the validity of collected data are important to consider in any research study. In ethnographic research, the human instrument is of primary importance, as rigor is established through prolonged engagement with the ethnographic site and its population, and through careful attention to triangulation of data sources and reflexivity in interactions with participants.

Prolonged Engagement

Carspecken (1996) notes the importance of prolonged engagement to minimize the threat of Hawthorn effects. This threat of engendering bias in participants due to the presence of the researcher can be reduced, paradoxically, by increasing the number of contact hours. Participants in the ethnographic site become accustomed to the presence of the researcher the more they are present, and even though their activities may be changed by the researcher's presence, they will still "employ the same cultural frameworks...as they employ in everyday situations" which are the primary object of study (Carspecken, 1996, p. 88). I observed the ethnographic site over two

semesters of activity, capturing a full year of interaction in both "seasons" of student acculturation: graduation and stabilizing of student patterns of interaction in the Spring semester, and the entrance of new students in the Fall semester.

While students were clearly aware that they were being observed, many were not sure of the purpose or scope of my data collection, and thus were unable to confound the research in a targeted way, even if they desired to do so. Over time, as students became acculturated to the studio space—with my presence and activity as a part of that space—I became a seemingly ever present force. One professor was noted as saying jokingly in class, documented via Facebook, "Wherever you go, Colin is a corner [sic] looking at you." This sustained effort of collecting data across many months proved to be successful in limiting any potential threat, while also allowing me to gain greater insider status than would have been possible with a shorter study.

Validation Procedures

Carspecken (1996) identifies a number of techniques to support the creation of objective validity claims in the process of data collection, including: 1) multiple points of view, 2) a flexible observation schedule, 3) prolonged engagement, 4) use of low-inference vocabulary in field notes, 5) use of peer-debriefing, and 6) member checking. I used all of these techniques in my process of data collection in the following ways:

1) I created a primary field note record, supplemented by audio recordings, photos, and a secondary digital field note record. In addition, I included data from interviews with a variety of students and other stakeholders, and incorporated student-generated data from their own Facebook groups.

2) My observation schedule varied based on activity in the space and my own availability, and I attempted to prioritize times of day when peer interactions were most common. I actively sought out different locations in the studio and classroom spaces, and included multiple observation sessions in the evening and during the weekend.

3) I included data from two semesters of data collection to ensure prolonged engagement in the space, minimizing potential Hawthorn effects. See below for additional details on this risk.

4) The primary field note record was low-inference, with any potentially higher-inference reflections annotated in brackets or otherwise indicated in memos or researcher reflections.

5) Peer debriefing was used during the process of reconstructive analysis, the primary reporting of which is found in chapter eight. In addition, I used interviews and informal group discussions to open up discussion about potential areas to refocus my perspective on people or times of day that may have been overlooked otherwise.

6) Member checking comprised part of the interview process, and was generally located in the second half of each semester of data collection to minimize any Hawthorn effect on participants and their actions in the studio environment. I also was able to use additional data from multiple participants who reflected on their experiences in the student-generated Facebook groups, or through the survey and interviews conducted during the summer months.

Anonymization and Privacy

All participants in the space were asked how they would like to be referred to in the final report through an online survey distributed in February 2014 (Appendix G). 52 students and faculty responded to the survey, which allowed them to select varying levels of anonymity. To respect the substantial contributions of many of the participants, and the growing recognition in collaborative ethnography that participants should have agency in the ways they are represented (Lassiter, 2005), I attempted to provide a wide range of options for students and faculty to disclose or ambiguate their identity in the final report. These options included their identification by name (assigned pseudonym, chosen pseudonym, actual first name, initials) and use of photography or other identifiable media (with name linked to identity in media, media used but without name linked, or no identifiable characteristics present). If participants did not indicate a preference, they were assigned a pseudonym, and any visual references are blurred or otherwise obscured.

To protect those who did not want their real name to be used, I refer to these individuals either through the name/initials they provided or an assigned pseudonym, but do not differentiate between these identifiers in the text. All media used in this dissertation respects the preference communicated by the participants, and approximately 40% of individuals present during the two semesters filled out the survey.

Reflexivity

Unlike more structured forms of data collection in the social sciences, ethnographic investigation is marked by reflexivity in the act of data collection. The importance of reflexivity is highlighted by Hammersley and Atkinson (1995), with the observation that "there is no way in which [the researcher] can escape the social world in order to study it" (p. 17). This paradox of researcher involvement in the reconstruction of cultural practices of an ethnographic site demands an active negotiation of values and beliefs on the part of the researcher, undertaken in a reflexive relationship of researcher to participant. This perspective is critical to understanding ethnography as a way of knowing, with the researcher embedded in the culture of study, rather than detached from it:

> *Reflexivity thus implies that the orientations of researchers will be shaped by their socio-historical locations, including the values and interests that these locations confer upon them. What this represents is a rejection of the idea that social research is, or can be, carried out in some autonomous realm that is insulated from the wider society and from the particular biography of the researcher, in such a way that its findings can be unaffected by social processes and personal characteristics* (Hammersley & Atkinson, 1995, p. 16).

The embedded nature of this form of research does imply some effect due to the presence of the researcher, but "how people respond to the presence of the researcher may be as informative as how they react to other situations" (Hammersley & Atkinson, 1995, p. 18) as the researcher seeks to reconstruct cultural frameworks (Carspecken, 1996).

As a researcher, I sought to be actively reflexive in my data collection—flexible to consider new sources of data and shift my approach where needed. To do this, I took on a number of participatory roles to explore how students reacted to various types of interactions in the studio. I

also actively developed strip analyses of interactions—working hypotheses on the function and system level that helped me to think about how things were occurring in this program, and why they may be occurring in this particular way. These hypotheses were constantly checked and refined with participants in formal interviews, informal conversations, interactions in the space, and discussions in the Facebook groups. In seeking out this reflexive quality, it required substantial dedication and adaptability on my part as a researcher. This included the forging of friendships and partnerships with some students, who would become my primary informants, but also recognizing how these this might color the data I collected and how others might perceive me based on these friendships. This complex arrangement of internal and external reflexivity was also a source of regular reflection for me, both in the formal data collection period, and at a number of points in the analysis process.

The Researcher

I have completed multiple studies in the ethnographic site chosen for this study (Gray, 2013a, 2013b, 2013c, 2013d, 2014; Gray & Howard 2013, 2014; Modell & Gray, 2011), and was known by the majority of the Master's and PhD students enrolled in the HCI/d program during the data collection period through classroom and/or social interaction, especially in the Spring 2013 semester. At the time of data collection, I had completed 15 credits of minor doctoral coursework in HCI/d, including many of the courses that first- and second-year Master's students generally take over the duration of their program. I completed this coursework with a number of HCI/d PhD students and some members of the 2013 cohort, and collaborate with several PhD students in ongoing research relating to design pedagogy. I have led several research studies in this department in the past two years, and several of the 2013 cohort Master's students had previously served as participants in these projects. During the first semester of data collection, I also maintained an office in the department adjacent to the design space being observed. Further, in

the interest of full disclosure, my partner was in his first two years as a PhD student in the HCI/d program during the period of data collection.

In the Spring 2013 semester, I took a course outside of the HCI/d program that two members of the 2013 Master's cohort also took as an elective. Since this course was focused on ethnography, I discussed my research and progress on several occasions in the context of this course. I had also served as a volunteer mentor for the 2014 cohort in Fall 2012, and so many of those students knew me in this more formal capacity prior to me beginning data collection. Finally, in the Fall 2013 semester, I served as a guest lecturer for the introductory readings course taken by the 2015 cohort for one class session.

In addition to my experience and interaction with the HCI/d program in a direct sense, I have also worked in multiple design studio environments in the past, both in education and professional practice. I completed my undergraduate degree and a Master's degree in graphic design, and worked professionally as a graphic designer and instructional designer in agency and consulting environments. These experiences inform my interpretation and recognition of design talk, both from educational and practice contexts, and the emergence of these behaviors in developing design students. Since one of the primary tasks of reconstructive analysis is to understand the bounded meanings of observable acts, this background is of substantial importance. My varied background in design education environments, as well as my previous research in this specific design education context, provides me with a uniquely rich understanding of a range of potential meanings and related horizons for many common activities found in a design studio or classroom.

Other Threats to Data Integrity

In any study, there are numerous internal and external threats to integrity of data collection and analysis. Because the data collection for this study incorporated classroom observations and faculty reflections from two members of this dissertation committee, attention to the anonymity of

data and clear separation of analysis from potential manipulation or mischaracterization was essential. All data were collected without oversight of any of the aforementioned faculty members, were anonymized prior to any analysis that was reviewed by these members, and any excerpts chosen for inclusion in the final manuscript were vetted for anonymity, as much as possible.

CHAPTER 4: GIVING VOICE TO THE NARRATIVE

I occupy a middle space among the participants, and inhabited a multiplicity of roles as I worked and interacted in the studio, classroom, and virtual space. Each of these roles is an artifact of my specific experience with this program, and thus it impacts the style of *reportage* in a substantial way. I am simultaneously design student, design professional, mentor, researcher, PhD student, and on rare occasion, teacher. Out of these often muddled and layered voices, I identified three important voices emerging from the data, which I believe fairly represents the story of these students, and allows the complex narrative to be told.

1. The First Year
2. The Second Year/Mentor
3. The Professor

My experiences span across these three voices in ways that were often uncomfortable to me as I collected data, since each voice brings with it its own expectations, norms, and assumptions of what information stays within that given community. I identified with the first year voice—the naïve non-designer taking their first tentative steps towards an often unknown or unknowable profession—because I had spent the previous two years taking courses with similar students, and had actively studied their experiences through an early set of pilot studies (Gray, 2013c, 2013d). For much of my undergraduate and early graduate experiences in design school, I also played this part of a tentative, often non-traditional design student as well. I also identified with the second year student, often a mentor to the first years in a formal capacity; I spent the previous two years serving as a mentor for an introductory design course in the program, and had developed a number of friendships with the 2012 and 2013 cohorts prior to their graduation. While I was not a professor or full-time academic myself, I had worked with two of the faculty for two or three years at the commencement of this study, and had substantial inside knowledge about their courses through extended conversations about design pedagogy and the intricacies of each cohort. Also,

on one rare occasion during the Fall 2013 semester, I formalized this professor role for a fleeting day, teaching one session of the introductory readings course for a faculty member who was traveling.

But, as mentioned previously, my representations of each of these voices is muddled in ways I want to be as transparent about as possible. While I once took the same introductory courses as the first year students, albeit in previous years, I never took them as a member of the cohort; from the start, I was an outsider who was only brought to the inside through a set of faculty and student contacts. So for the first years I studied, I was their mentor, someone in a position of power for the 2014 cohort, and for the 2015 cohort, I felt like an awkward outsider who watched their every move, without any defined role that they were familiar with.

Despite the limitations of both my own experience, and my inability to render a "pure" voice, I will attempt to convey the student experience through these three expressions of the reality of the program, as mediated by my prior experiences and participant observations. In the first semester of data collection (chapter five), the faculty were not actively engaged in data collection, so their voice is limited; since the students are more unified in the Spring semester, after they have the same general grounding in what designing consists of, a single narrative will be presented of this semester. In the second semester (chapter six), numerous data sources (e.g., reflections, interviews, and classroom observations) support the professor voice; because of the substantial distance between naïve first year students and somewhat experienced second year students, who also serve as mentors, two narratives will be told of the first semester, with the first year narrative presented first. The Fall 2013 semester is presented first, even though chronologically, it appears after the initial Spring 2013 semester data collection. This *in medias res* construction is intended to foreground the experience of the first year, drawing the reader into the story from this viewpoint, as it comes into conflict with the second year and professor voices. The Spring 2013 semester is then presented in chapter six as a concluding narrative.

The student voices I present are built up from a composite of second year students, first year students turned second years, and first years—representing a dynamic, evolving student as they move through the program. Wherever possible, I attempt to provide quotations or paraphrases from students and faculty to support these voices, taken from interviews, observations, Facebook interactions, and faculty reflections. The professor voice is often more complex, based on insider knowledge I gained through interactions between multiple faculty members over my years in the program—first as a student, and then as a researcher. I attempted to document quotations and paraphrases from reflections, studio activity, and classroom teaching, often moving beyond what a first year student might understand in these contexts from a speech act, and taking into consideration how these speech acts reflected a broader viewpoint of that professor in the program. One faculty member, Dwight, was not interviewed and did not complete faculty reflections since he did not teach in the Fall 2013 semester, but his activities in leading orientation and a student town hall were observed and documented.

Whenever I characterize someone's internal psychological state, it is based on conversations with the individual. The impressions of my surroundings, of the relative importance of speech acts, and the overall dynamic of the program are amalgamations of previous experiences, interviews, and other sources of data spanning from 2010 to 2014. In these two chapters, the source of these voices is not conjecture, but rather low-inference, documentary evidence of what has occurred. While I insert my own voice as a researcher into all three voices as the constructor of those voices, the contents are rooted in empirical data.

Finally, it is important to address the epistemological and ontological status of these voices, including how they emerged and were constructed in this final narrative, and how these voices should be viewed in relation to the interactions in the ethnographic site. The initial construction of the three voices was based on structures that I located within the program and studio itself through the process of data collection, and based on strip analyses created throughout the observation

period. These voices or "organic idea types" emerged in the studio through interactions between individuals, as they engaged in communicative acts in relation to their perceived role in the program and the underlying structures of the studio environment. These voices, therefore, are reconstructions of structures that were identified and described over the course of data collection, but were also explicitly taken on and referenced by all three groups. These are not "ideal types," but rather a set of roles—based in deeper system relations and structures—that students took on readily and explicitly; these voices would be readily recognizable by faculty and students in the program, and are presented here to represent the diversity of roles and perspectives available in a moderately sized studio program.

CHAPTER 5: "WELCOME TO THE SWAMP"

Orientation and Acculturation

First Years: Tentative Greetings

The morning of orientation dawned in late August 2013. New students—representing many nationalities, ethnicities, and educational backgrounds—clustered in small groups around coffee and juice on their first morning together; they were located in the lobby outside of the main classroom they would be using for the remainder of their program, but for the moment, everything was new. Most of the students had met each other online in the Facebook group established the previous spring, and a fair number had even met up a couple of times in the month of August as they started to move into town. Even with these initial encounters complete and names and stories exchanged, the talking was minimal, and students split up—largely on lines of nationality—when they finally sat down in the classroom a few minutes before the top of the hour.

Marty, the head of graduate programs and one of the core faculty members for the HCI program, started off the orientation by dimming the lights and cuing up a video. The video began playing, filling the room with upbeat music, introducing the new cohort one student at a time, each with a photo and name (Figure 9, left). Several minutes passed as each of the 40-odd members of the cohort received their own brief introduction. At the conclusion of the video, a grid of all the students appeared (Figure 9, right), mirroring a handout of the cohort found in a packet that was given to the students upon entering the room. This photo grid slowly turned from black-and-white, as each student's photo was originally presented, to color; the words "welcome" appeared, followed by the inciting phrase: "let's change the world through design." With this auspicious beginning, the students clapped excitedly.

Figure 9. Photos of students introduced one-by-one (left); a grid of photos representing the cohort.

These now first-year students were then given a task—to pair up with someone at their table and find out more about them. After 10-15 minutes, they would introduce what Marty termed their new "best friend" to the class. Marty introduced the process, asking students to mention their partner's nationality, educational background, what they are most looking forward to, and their "greatest fear." After this was announced, the noise in the room grew louder and louder as students shared their stories with each other, exchanging their demographic information, their hopes and fears, embarking on what would prove to be a most unusual journey.

Figure 10. Feng introducing another student as Marty and the rest of the cohort looks on.

After the allotted time had passed, pairs of students stood up, two-by-two, sharing a standard orientation introduction, often stumbling awkwardly through unfamiliar names, home countries, and educational specializations (Figure 10). But the most time was spent on sharing their fears about entering this yet-unknown program. These fears seemed to cohere the students, each one speaking more confidently than the last, as each one realized that all of them shared the same sorts of apprehension—to name a few: of not being able to measure up to expectations, of outright failure, of communicating effectively in English, of presenting in public, of their lack of design experience, of not wanting to let people down, whether they will be happy in this new life they have chosen.

I will now switch voices—from the first year student to the professor. In future sections, the voice will be identified by the heading, with many sections of the story being told from multiple perspectives in multiple voices.

Professor: Goals and Views of Design in HCI

After students were given a chance to introduce each other, the core program faculty—David, Mei, and ES—entered the room, joining Marty and Dwight, who was also in the room. Dwight is the new head of the program, while Marty has led these orientations for a number of years. Before faculty are given a chance to introduce themselves and start a formal "faculty panel" discussion with the students, Dwight starts off with an overview of the program.

Dwight set off by presenting himself as the one that maintains "rigor" in the program. For a short while, he talked about the student panel, which would follow this faculty panel. The student panel has historically been closed to faculty attendance, but there was a possibility that Dwight wanted to attend this year anyway, over worries that the students might hear a view of the program or faculty that was not as positive as he would like. Dwight encouraged the new students to "form [their] own opinions," stating that the "most vocal people in the cohort ahead of you are not the ones that do best in the program." He then mentioned the student panel, telling the students to "take what hear you there with a grain of salt." After this brief introduction, he introduced his own courses and views. He mentioned a wide range of issues, both in relation to his course, and to his view of design and research within HCI. There was mention of "scholarly" resources like the Association for Computing Machinery (ACM, the professional organization HCI is most linked with) Digital Library, and photography-related tools like Adobe Lightroom and Photoshop He also talked about a focus on individual performance, and that good designers must create their own visual artifacts, and not use others' work, even by permission; this all appeared to be part of his approach to visual literacy, design thinking and strategy, and scholarship, all of which he linked directly to keeping up "standards" and "rigor."

Dwight focused on a subset of creative tools, mostly photography related, with no reference to most of the tools that students would use in their everyday work in the

program. He also presented what seemed like a harsh individualism, downplaying working in teams, even though most of the curriculum focuses on teamwork and collaboration.

Marty then re-introduced himself to the students, but this time as a researcher and professor, rather than emcee of the orientation. He situated his expertise as a designer and professor in research he has done on design pedagogy, and through an NSF grant relating to design practice that he is working on with ES. After this background information, he again mentioned professional practice, explaining that he is the only faculty member in the program to have an ongoing startup company and professional design interest, announcing that he is "launching the company today." Marty then moved on to explain his view of pedagogy, with failure espoused as a "good thing," and his understanding of design education as flexible and evolving based on the research he is conducting. Bridging off of Dwight's discussion of downloading Adobe products, he also mentions IU Anywhere, a virtualization option to access many software tools through a computer or tablet, but then focuses his attention on non-digital "professional tools" such as good paper and pens. He foreshadows the first class the students in this cohort will experience, setting expectations high by reminding students: "don't be late." He explains that if students arrive late, they will have to wait outside until after the first part is over, because he doesn't want this course opening to be disrupted.

Marty heightens the drama of his first class through his warnings about being late. He also distances himself from Dwight by focusing on analog rather than digital tools, establishing his credentials in design pedagogy by linking to his research in this area.

ES mentions that he has to present his work quickly, since he has other departmental duties to return to as department chair. His focus is almost entirely on the research side of HCI, and he explains that "you can do almost anything you want to do related to computers and interactions

and things" in this field. He also shared his desire to understand practice, relating his work to the NSF grant he and Marty are working on, explaining: "we learn about actual design practice and bring that into the classroom." ES briefly describes his courses in Experience Design and Design Theory, then leaves the room.

Through this introduction, ES, like Marty, links his success in the classroom to his understanding of design practice, using this reflexive pedagogy—capitalizing on connections between theory and practice—as a catalyst to briefly describe his courses.

David comes across to the group of students as slightly aloof and humorous, which immediately seems to capture their attention. He begins by mentioning his research, in conjunction with Mei, his wife, on World of Warcraft and gaming, along with parallel work in the arts and literature. After briefly introducing his courses, an introductory readings course the students will take their first semester alongside Marty's course, and an elective course called Interaction Culture, he wishes the students well, telling them "hopefully this is a transformative two years for you."

Mei's introduction is almost directly parallel to David's, since they work on many of the same research projects. She also has the added benefit of being a non-native speaker, and mentions this directly to the international students in the program. She discusses her research on gaming and craft briefly, but then shifts to talking about the new group focusing on making that she is working on with another colleague, mentioning that this work on making and hacking will inform her prototyping course offered to second year students.

Both David and Mei align their work differently than the other professors, focused more on gaming and making activities. Both seem to attempt to forge a bond with the students on different levels: David through his self-deprecating style and interest in gaming, and Mei through her non-native status and empathy for similar students.

Second Years: Telling It How It Is

The student panel is a loud affair, with a dozen or so students appearing after the faculty have exited the room. Almost all of the second year students are mentors for Marty's course, and he was influential in setting up the student panel, even if he isn't there to see it unfold in person. The first year students ask dozens of questions over the course of an hour, ranging from communication with faculty to collaboration opportunities to learning from diverse student experiences. Adam, a second year student with a background in industrial design, was an unofficial leader of the panel. He explains at the outset that they were told to "preface all this with…every single person's experience is unique to themselves, so what I liked and what I didn't like is probably going to be different from you and different from all of the people on this panel." While the second year students actively invite tough questions—the kind they claim you couldn't ask with faculty members around—most of the first year students don't yet seem to have a sense of what questions they need to ask, and tended to focus on less personal kinds of issues.

Early on in the panel, we see several of the white male students, including Adam, Stephen, and Matthew, unintentionally asserting their dominance—both in volume of voice and in length of time speaking. Even though there is a relatively equal mix of females and non-native speakers, they do not speak proportionally to their representation. Several of these dominant speakers become Marty's most trusted mentors in the course, with Adam and Matthew also serving as associate instructors. The leaders that emerge from this panel will dominate the program for the remainder of the semester. Other regular respondents on this panel will also be some of the main characters from the second year cohort for the remainder of the semester, including: Emily, who is known for her strong research and writing skills, and peppers her conversation with references to cats; Stephen, who has a background in visual design, and becomes one of the main organizers of the collaborative "Mad Skillz Club," and Ashleigh, the third associate

instructor, who started taking classes in the program two years ago, and is now part of the second-year cohort.

Ashleigh advises students to share their projects with each other and get feedback and critique, explaining that "now that you're in the program, it's no longer a competition—you guys are colleagues. You want to help others succeed." Adam tells them to "use your space upstairs…that whole floor upstairs—that's our floor…that's where you're going to get better, not in 150 [the classroom they are currently in]…you're going to get better upstairs." Matthew, a husky student with an undergraduate degree in philosophy agrees with the other panelists, saying "that space is magic. That is something that cannot be stressed enough. Spend time up there. Do your work up there…things just kind of occur; it's hard to explain." Overall, Adam says that "everything we say ties together: Why do we mentor people? Why do we have to be reflective? All of these things account to becoming a better designer."

This first narrative is told primarily from the vantage point of first year students during the Fall 2013 semester. With the matriculation of a new cohort and the commencement of a new school year, the story, in many ways, is all about the new students, so this narrative reflects that reality. It is grounded in the major milestones during the Fall 2013 semester as projected by the first years, but is balanced by the voices of the second years and professors.

Starting Classes

First year students were enrolled in a predetermined set of courses, except for a couple of students that were attending half-time. The course schedule (Figure 11) left large blocks of time open for project work and meetings. Two classes were required: a six-credit introductory design course (called IDP by people in the program), occupying three different class sessions on Mondays

and Thursdays, one of which was referred to by Marty, the instructor, as "design therapy"; and an introductory readings course taught by David, which covered foundational literature in HCI.

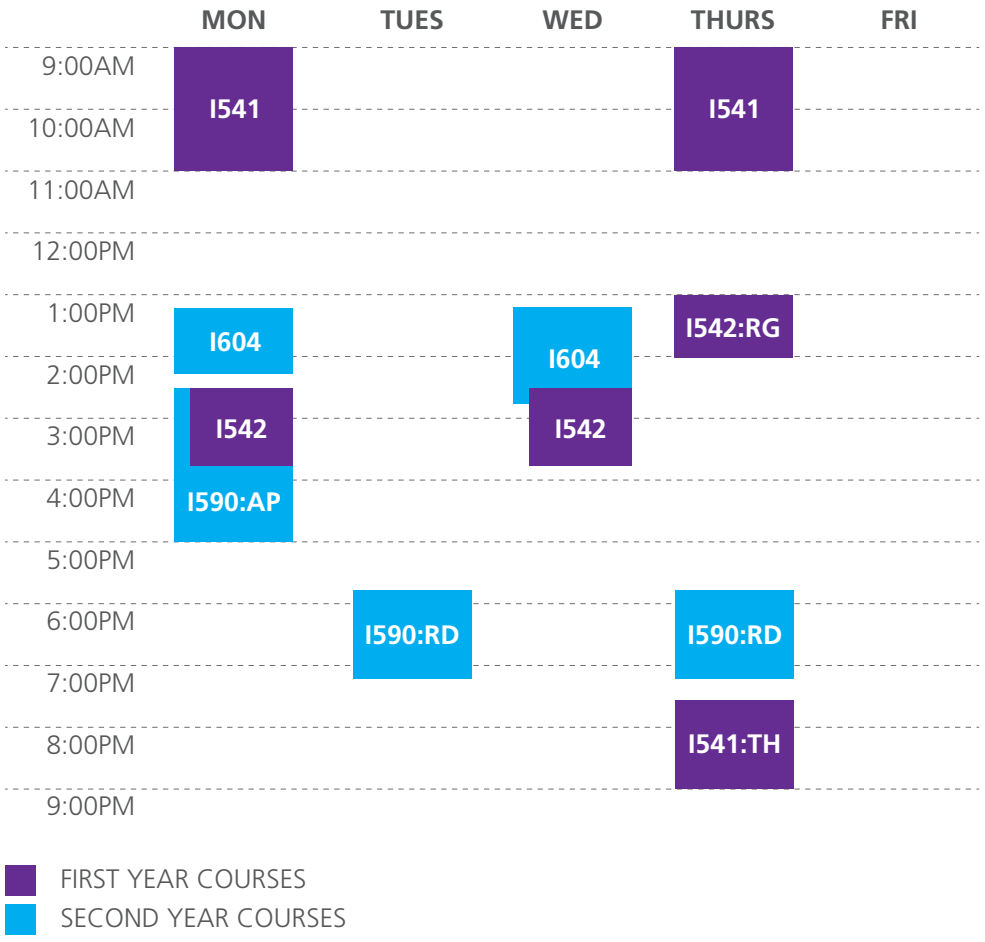


Figure 11. Fall 2013 Course Schedule.

Second year students had only one required course during this semester, which focused on advanced prototyping techniques, taught by Mei. In this course, they learned a range of physical prototyping and making approaches, including integration of microcontrollers through the use of Arduino and perceptual computing through a custom camera provided by Intel. They were also able to select from two electives being offered in the program: Design Theory, a course taught by ES with a focus on implications of theory for design practitioners; and a course on Rapid Design taught by Marty, which provided students additional design practice working with real clients

(primarily alumni connections in a range of companies) using the concept of "slow change" as a focus for design that is sustainable, evolving to shifting user needs over time. Many second year students were enrolled in both elective courses.

To focus attention back on the first year students, I will now discuss the first experiences in the introductory design course and readings course. Through these descriptions, two different themes of design in HCI emerge, which will later be discussed as two "discourses" on design.

"Getting in Zen Dog's Boat"

Marty's course was the first of the semester, starting at 9:00AM on a sunny Monday morning. Students had been prepared in the orientation to arrive early, and many did, talking loudly as they waited for the session to begin.

Professor and Second Years: Marty's Goals

But the preparation for this day had started days and weeks ago. Marty was fastidious about making sure that everything needed for the quite involved first class was ready to go, and he had recruited 15 students from the first year cohort—a mix of high performing students, with a roughly even distribution of gender and ethnicity—to serve in this volunteer position. Three students from this group also received an assistantship stipend, but the remainder agreed to serve with no payment at all; as Marty explained to them in this meeting, "you're doing this all as a volunteer, and you're amazing!"

Figure 12. Marty meeting with his selected mentors at his home prior to the first day of class.

So, on the Sunday night before classes began, they gathered at Marty's home (Figure 12). The atmosphere was full of greetings after a summer away, as many of the newly branded second years swapped stories about their internships and welcomed each other back to town with hugs. Marty then led the students through a handout listing a number of activities, many of which he had used for years to prep mentors for this course. They started with a discussion about their favorite mentor from the previous year, and why that was the case, followed by a discussion of less helpful mentoring they had received. The students then started sharing more personal details about their experiences with differing personalities, approaches to design—people who were to quote one participant, "full of shit," and others who were present, always guiding them, not leading. Marty concluded this part of the conversation by explaining to the students that this diversity of mentors was a "feature, not a bug," and that there is "no personality that makes the best mentor"—it's more about being willing to use your personality effectively.

Marty then told the second years that the goal is to teach the first year students to ask "what's the bigger strategy," not teaching specifics; guiding students towards metacognitive thinking, "ask[ing] them to reflect." He also stressed that he didn't want the students to be mini-Marty figures: "I want you to be authentic you, not to mimic me." He revealed some of what he called the "mystery" of what may have seemed to be an unplanned moment of him "throwing a fit" in the previous year, explaining that it was "really carefully planned" with mentor assistance to affect the first year students and "shake them up." Marty also told the mentors that he wanted them to tell him about issues—"rich feedback, not spying"—and that on the first day of class, he wanted them to sit along the outside edges of the classroom, and "to be sensitive to the people around you" if they chose to use their computers during class. Above all, Marty said, it was important for the mentors to "defend the class…I've heard it all over the years…[but] there's a reason for this stuff. Understand and minimize the case of the student who poisons the class." Adam agreed with Marty, saying with a sad expression on his face that "there are people who don't buy in" and that the mentors needed to "maximize the antidote [to] minimize the poison." Marty explained that this poison was actually fear—of "having to be vulnerable" and being asked to do many new things; "I don't know what it's like to be on the other side—I sense it's difficult."

The conversation then shifted to the first project, which Marty said is supposed to be very difficult, if not impossible to complete; a way for students to fail early on. The mentors agreed with this assessment, with Stephen saying "the point of project one is to fuck up"; Matthew felt it was to force them to create a design "that addresses the problem but doesn't solve the problem." Marty agreed with both Stephen and Matthew, who had experienced the project first hand, explaining that "I sort of want them to boil in their own water…every problem in the book comes out in the thermostat problem. We want them to fail and fail hard."

In this early meeting, Marty sets the mentors apart, giving them insight into what he views as the "magic" of the course. They are given explicit permission and instructions

to locate students who aren't "buying into" the program, and are now part of the system that will essentially force students to "fail and fail hard."

First Years: Building Trust

For the first year students, the experience also started long before the first day of class. Marty had already contacted them multiple times over the summer: he had emailed them with a letter to share with their parents about the program; he had been instrumental in creating the student-sanctioned Facebook groups; and he had solicited their photographs, coordinated with a student to create a contact sheet with all cohort members on it, and then "introduced" them in the polished slideshow that kicked off the orientation session.

Through all of these early contacts, Marty had established himself as a caring personality in advance of the students' arrival, slowly gaining their trust—preparing for the activities of the first day of the program that, as he said, "will change your life." In addition, he had worked to encourage students to create the infrastructure behind the scenes to allow students to bond and get to know each other through the Facebook groups, which were the primary method of organizing meetups once the semester began.

First Years: The First Day

The first class began with a dramatic flourish, as Marty had promised in orientation. It started with the ringing of a small set of cymbals, penetrating the room with a piercing chime, which slowly drifted away as Marty began a video, again with dimmed lights, which was titled as an "interaction odyssey" set over Indian music as images of fine art, laptops, and digital devices were displayed. Then the words: "before the gates of excellence, the gods placed sweat." After the video ended, he proceeded to show off example after example of things that are designed, starting with the pop and slow hiss of a Coca-Cola can: "Do you hear that sound? That sound was

designed." After sharing cans of Coca-Cola to the entire class, he moved on to other examples such as the interfolding of Kleenex to the built in handles of a Tetley teabag (Figure 13). "Great design doesn't require you to think about it; great design is just there!"

All of these examples—shown over a period of 20 minutes or more—were introduced to show the raw power of design to transform—to delight—to create experience—and ultimately, for this audience of fledgling designers, to empower and convince them that they would be able to change the world.

Figure 13. Marty inviting students to try out the interfolded design of the Kleenex box as they drink cans of Coca-Cola he has provided.

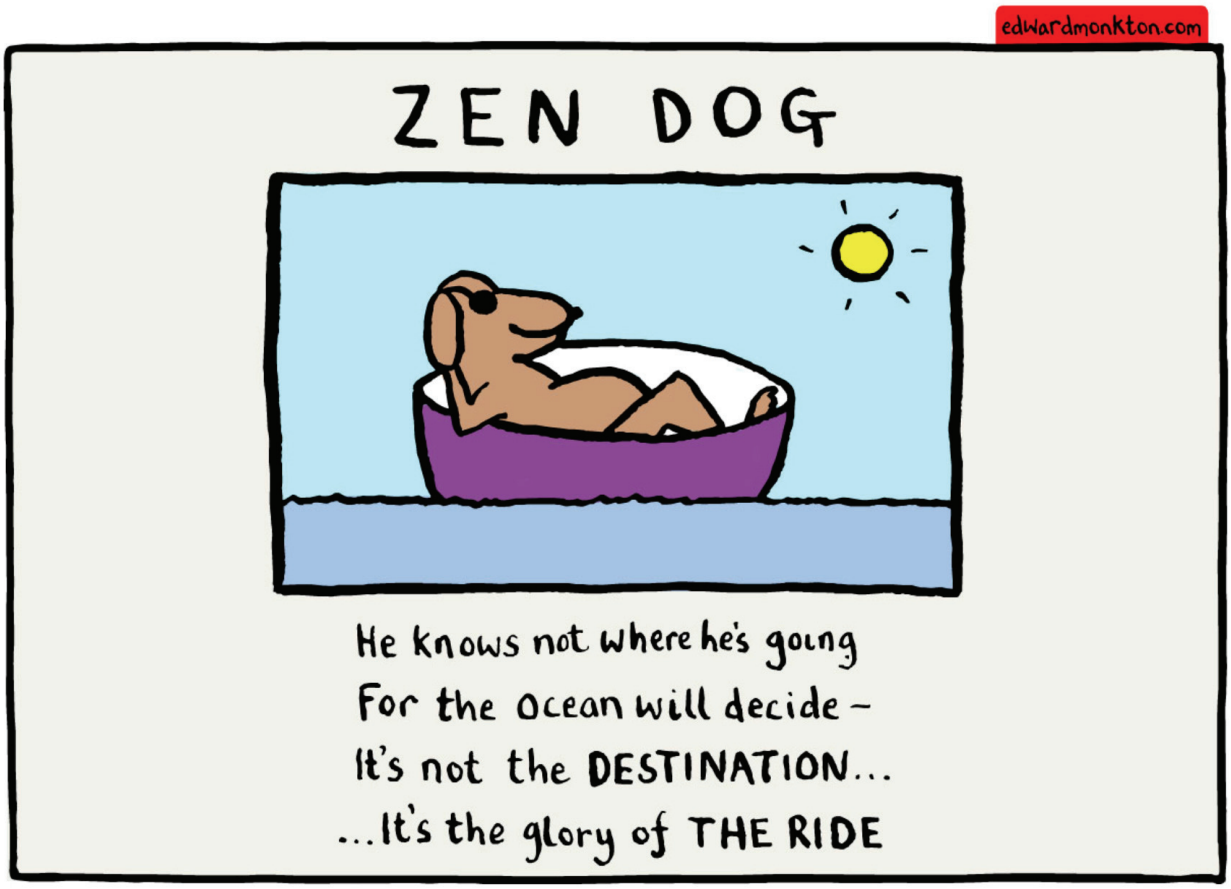


Figure 14. "Zen Dog," as seen on the front page of the course syllabus.

Marty then introduced the course "mascot" (Figure 14) he had chosen by saying: "There are two ways to think about this—as a typical course…[where it's] easy to get a little bit cynical…pushing back. But I want you to enjoy the ride—get in that boat—you don't know where this is going to take you."

From the start—in orientation and in "selling" the program to students—Marty billed his class as unlike something you had ever experienced. He continued with this Jobsian "reality distortion field" in this first class, where he introduced the course "mascot," Zen Dog. He encouraged an almost mindless, yet passionate commitment on the part of students; for them to devote themselves to this educational experiment, like the 13

generations of students before them: "Trust the process…there's a bigger design that's in play."

Marty presented this course as the entrance to Schön's "swamp" with a quote from the beginning of *Educating the Reflective Practitioner* (1987), displaying a page of the syllabus on the screens surrounding the room:

> *In the varied topography of professional practice, there is a high, hard ground overlooking a swamp. On the high ground, manageable problems lend themselves to solution through the application of research-based theory and technique. In the swampy lowland, messy, confusing problems defy technical solution. The irony of this situation is that the problems of the high ground tend to be relatively unimportant to individuals or society at large, however great their technical interest may be, while in the swamp lie the problems of greatest human concern. The practitioner must choose. Shall he remain on the high ground where he can solve relatively unimportant problems according to prevailing standards of rigor, or shall he descend to the swamp of important problems and nonrigorous inquiry?* (p. 3)

After this introduction to what he called the swampy ground of HCI design, Marty told the students: "What we're not going to do is just tell you…the goal is for you to be the best you," not to produce an imitation of some ideal student or copy of himself. This was communicated through what he referred to as "playing the whole game of HCI design"; this "whole game" framing was explained initially by going over an early diagram of the game of baseball, and then using that as an analogy for students to visually map out their own understanding of what HCI design was for them. Marty also told students the kinds tools were acceptable, and which were not, by picking up a student's average lined college notebook, and saying: "notebooks like this, I don't want to see them again." Instead, he asked students to buy professional pencils, pens, and notebooks from a local art supply store. Before the class ended, the work began, and students were asked to form teams of two for their first of five projects.

Marty's experiential approach to teaching is revealed during this first day, with a strong focus on reflection and being "the best you." He also provides students with tools

to reflect on an ongoing basis, both through the "whole game" sketches and through acting like a professional by using professional tools.

"Study Users, Build Shit"

First Years: The First Day

The students gathered in a slightly smaller, more traditional classroom Monday afternoon for David's course. The students were almost all present well in advance of the course start time, and three second year associate instructors (AIs)— Emily, Rayne, and Isabella—sat along the east side away from the rest of the students. Because of scheduling issues (see course schedule, Figure 11), these AIs were introduced by David, then they had to leave to attend the prototyping course in the main classroom.

David then started by stating what he thought HCI was all about: "If you learn anything in the program, it should be these words—study users, build shit." He then explained why he thought this assessment was accurate, mentioning that this rendering of HCI is "validated by job titles" in the field, while also jokingly questioning aloud why he was teaching this course, "not knowing anything" prior to starting it several years previous. He then focused attention to the framing of the course itself, which he said drew on "how the field understands itself" through major journals, conferences, and textbooks. David made a reference to Marty's sense of the field being "playing the whole game," saying "that's Marty's take—it's his point of view. But I focus on the field and how it thinks about itself." He also warned students: "I teach stuff in this course I positively despise, and you'll know it." Following this brief 10-minute introduction, he asked the students what they thought HCI was, and students offered their own take on the field as David wrote the ideas on the whiteboard (Figure 15).

David uses what will be a characteristic self-deprecating humor, which seems to resonate with the students, just as in the orientation session. This will be characteristic of

his teaching style throughout the semester. When writing the student comments on the whiteboard, he often offered to "translate" their ideas into more appropriate HCI terminology, nonchalantly introducing new vocabulary.

Figure 15. Students offering suggestions of what HCI includes as David writes them on the whiteboard.

Through this conversation, and a PowerPoint presentation that framed HCI through four quadrants—technologies, the user, design process, and application domains—David continuously mentioned the diversity of the field, and how relatively young it still is. He then introduced the idea of "waves" in the field (similar to Kuhn's paradigms) to introduce the role of design in HCI—through the emergence of experience design in the 1990s to the current state of design and HCI as "uncomfortable bedfellows," citing a well-known paper on the topic (Kuutti, 2009). After providing this historical view of the field, David mentioned to the students that this specific HCI program is relatively unique, and known for its design-focused view on the field, and that all six faculty "agree on this orientation." David concluded the class, calling on students: "don't just

make another freaking iPhone application for your capstone," encouraging them to think towards a broader range of design outcomes.

David focuses on his interest in the edges of the field, set up earlier in the PowerPoint presentation and shown off to dramatic effect through two different design videos from the ACM CHI 2013 Technology Showcase. Through these interests, he also implicitly situates his understanding of where design is located in the field at large, and that one of the focuses of this program is to expand that minority view. He also focuses on entirely academic references in this first lecture, using video examples from the large academic conference in the HCI community, and citing a well-known paper from that same community.

Professor: David's Goals

This course is built on an understanding from David of "what the field says it is." As he explains to me, this perspective comes from years of reading the literature of HCI, making sense of where it has come from and what it is now. David mentions in his early reflections that the goal of this course is to "understand that HCI is a profession and a discipline…to understand that membership in the IxD community means knowing what everyone in that community knows, i.e., to share a common vocabulary and basic set of professional practices." He also directly wanted to "counter the romantic 'genius' notion of a designer and argue that design is a disciplined process" as he presented design as a concept within HCI.

This understanding of what HCI design is seems to be enacted as a guiding philosophy for David and Mei's portion of the curriculum. While both of them come from a literature background, they have worked to understand what design pedagogies look like, and through this, have focused on the constructive act as a primary means to "do"

design. Both of them have focused much of their research on critical design, and this follows through to Mei's course, where she actively engages students in building non-digital or non-traditional prototypes, as David encourages students to do in this first class.

Two Discourses of Design

While David uses the power of literature—of HCI as an academic discourse and professional field—to justify his pedagogy, Marty primarily uses the power of showmanship, relying on designed artifacts and experiences almost entirely outside of the domain of HCI to empower students—as designers, first and foremost—with any talk of HCI-specific issues blending into the background. This tension that is introduced early on is palpable for students, but since there is little talk between professors about the nature of their specific courses, professors appear less aware of the specific way this doubled discourse emerges in this first week. Marty knows from years of encouraging students to move from non-designer to designer that nothing less than a full-blown shift in identity will do, and so he introduces and then constantly preaches an oddly religious sort of surrender to his course and the program at large. There is still a strong commitment to the individual, where the former identity of each individual—their educational background, their professional experience, their hobbies—takes on a new purpose within this new designerly role. For David, the focus appears to be more on grounding knowledge of the field, and of design within that field; this undergirds his underlying assumption that a disciplined practice of design will follow after this baseline knowledge is in place. He strongly advocates for emerging portions of the design world in HCI, but also respects that significant portions of the HCI community do not view design as this program does. Marty makes no such distinction in his course.

Studio Life

The design studio space was the nexus of data collection for this project, and served as the hub for project meetings, making activities, collaborative sharing and student-led educational events, and communication between students through many types of artifacts and talk. Before I discuss more fully the student experience of the studio, I will start by locating the studio as a space, and its relation to other spaces in the building.

Locating the Studio

The physical center of the HCI student experience is the Graduate Design Studio, located on the third floor of the Informatics connector building. A connector building—bridging two existing buildings—was built in 2010, but remains isolated due to the lack of direct access, apart from a serpentine path through the older building complex. To access this space, you must travel through the old Informatics East or Informatics West buildings, walking through winding hallways to a stairwell, then traveling up six sets of stairs to the third floor. If traveling up the Informatics East stairwell, after reaching the third floor, a large gray metal door stands to the right of the third floor stairwell, marked simply as the "Graduate Design Studio." Approaching from Informatics West, you must travel up six flights of stairs to a landing with a metal door. After going through the door, you must navigate a maze of corridors, first to the left, then the right, finally arriving at a gray metal door similarly marked "Graduate Design Studio."

Entering the Space

Upon entering the space, you feel the large metal door thud shut behind you. The space is saturated with the sensory feelings of a contemporary workspace—muted carpet; dim, yet appropriate, lighting; the presence of windows and natural light; soft-walled cubicles and glass-divided spaces. Approaching from Informatics East, one must travel up a small flight of steps, with the east end of the studio space gradually coming into view. The space is lit by windows flanking

the north and south walls, including large floor-to-ceiling windows on the south, and smaller, clerestory-style windows on the north. The ceilings appear higher than the surrounding buildings one walks through before entering the space, and the quality of light shifts from harsh fluorescent light against white cinder block in cramped hallways to a taller, open ceiling in a space with few walls and dominant natural light sources and indirect fluorescent fixtures. Arriving from Informatics East, one experiences large swathes of light passing adjacent to large faculty offices, which are divided using stretched light gray fabric, on the left-hand side. The entrance, including the east side of the space is dimly lit, in contrast to the natural light coming from windows on the south side, and stronger fluorescent light coming from the main design space and the small conference room. Directly center, a central wall runs parallel to the space, dividing the faculty offices from the primary design space. On the right-hand side, an open area with study carrels is visible in the foreground, interrupted by a brightly lit meeting room with an external glass wall, looking toward the design space, which is populated by a variety of chairs and tables, visible in the background. Faculty offices with floor-to-ceiling glass doors are present in the space, located on the south side and on the on the east and west ends of the design studio.

Outside of this studio, courses are held on the first floor of these buildings. Most courses are offered in a large room with six screens and two TVs flanking a computer stand in the center of the room, with tables fanning out in all directions. In addition, two more traditional lecture rooms on the first floor are the site of David's readings course and ES's design theory course.

First Years: Shy and Introspective

Many first years were almost completely missing in action during the first weeks of the semester (Figure 16). They attended class, but then disappeared to go home or elsewhere, participating only in the virtual Facebook space where they had come accustomed to interacting with their cohort. Even though they had been strongly encouraged to work in the studio by the

second year student panel during orientation, most students chose not to take this advice, for varying reasons.

Figure 16. First year student Cameron meets with other members of his cohort after their first class.

Sonya, a first year student with a background in architecture, was familiar with the idea of a design studio, and "wanted to spend less time in the studio" as compared to her undergrad. Other students like Alec, a first year student who had taken courses in the program prior to joining this cohort, committed to using the space due to advice from his girlfriend, a second year, and to help "partition home from work." Keisha, another first year student with some professional experience, welcomed the opportunity to build things and collaborate, but found it difficult to adjust to the amount of noise, but wanted to "let the right distractions filter through" and "learn how to deal with and negotiate that chaos." Feng, a Chinese student, was still uncomfortable speaking English, saying "it would be better if I was more brave"; she, and other non-native speakers tended to interact more with other students along lines of nationality or ethnicity, to find

comfort in speaking their first language in an environment that they mentioned was full of stress and change.

The students who did commit to hanging out and working in the space were there frequently. They often set up shop in the studio for large portions of the day, and worked in the space regardless of whether someone else was there or not. I was told later on in the semester that they had heard continuously from the second years and professors that being in the studio was a marker of success, and while they didn't necessarily understand why that was the case, this small group of first year students mentioned that they had taken the advice seriously.

A relatively small number of second year students were present in the first two weeks of the semester, as schedules became established, and routines of work started to take shape. But the few second years that were present did attempt, on rare occasion, to engage with the new students, sharing methods of collaboration, interest in talking about projects, and a discussion or critique of the project one teams' work. While some of these conversations began due to a mentoring role in the introductory design course (Figure 17, right), other conversations seemed to happen more organically between more gregarious non-mentoring second years that were working in the studio (Figure 17, left).

These early interactions set the pattern for the kinds of communication this core group of first years were willing to engage in—and while they were generally more shy than some previous cohorts I had been a part of, they were smart and reflective, willing to engage in conversation, yet not yet comfortable with seeking out collaborative discussions themselves.

Figure 17. Second year students interact with students, both in a non-mentor role (left) and as a mentor to a project one team (right).

Second Years: Head Down and In Our Own World

Second year students were infrequent participants in the studio in the first weeks of the semester, and when they were, they generally isolated themselves from their first year counterparts (Figure 18). Almost all of the second years present were mentors, and were generally working on their projects for Marty's rapid design course in teams of three.

It was unclear how the second years were coping with the shift in their role—from a relatively egalitarian social environment during their second semester, where everyone had a roughly similar view of design, studio norms, and related processes, to their new role as mentor. This semester brought many changes, including the presence of a new cohort

that was yet an "unknown quantity," alongside learning how to be a mentor—a role they had only previously seen from the other side.

Figure 18. Students meeting in teams, segregated by year (top); Ashleigh and Stephen interacting in the studio at Ashleigh's favorite table (bottom left); second year students JF and Nathan talking as Cameron and Zan work at the table (bottom right).

Professor: Why Aren't Students in the Studio?

Marty wondered aloud to mentors and to the first year students in his course: "Why aren't you in the studio?" In IDP on August 29th, Marty called out students for not being in the studio—"the rest of you are missing." He then told the students: "I was upstairs yesterday for most of the day and aside from two or three, maybe four students in this cohort, the rest of you were missing. Where were you? Home?" Students verbally called out a number of reasons why they were not able to be there, including the noise of people talking and socializing. After hearing two different students with this concern, Marty told them,

> *You can tell people to be quiet...sometimes it gets loud, especially if [Adam] is there…but you also have to learn to work in an environment with noise…it's not that you need silence around you; sometimes the conversation is part of your education and opportunity and networking. And besides, if you don't take control of that room upstairs, the second years are going to dominate, and you can't let that happen…I want you guys to really take ownership of that room and make it yours…You don't realize how much power you have and I want you to start thinking about it, and you are the very entitled first year students of the HCI/d program. Take control of that space and be there…you have easy access to me, you have easy access to second year students who are just sitting there wondering, where are they? Why aren't they asking any questions?* (08292013A, I541)

This fit with Marty's overall stated approach for the course—not solely based on traditional academic performance: "I'm here to develop myself as a professional; not, will I be tested on this?" (08292013, I541). Marty saw this as a focus less on skills and more on the attitude and identity of the individual student (Reflection, 09092103). As he explained in an reflection interview with me, "What I'm trying to do is disturb their world, or their world as they see it and shake it up a lot" (Reflection, 09092013).

Marty seemed to use presence in the studio as a way to gauge a student's commitment to the program, and tacitly, as a form of guilt to ensure their future presence. This early encouragement to be in the studio began a pattern of comparison between the first years and second years, which drove a wedge between the cohorts that would cause increasing tension as the semester wore on. This eventually came to a head in mid-

November with a first year led cohort meeting. The focus on presence in the studio also introduced a more designerly/professional way of acting to the students, implying that success in the course was just as much about their interactions outside of the course as it was their work inside the classroom.

A Weekend Away

In September, Adam received permission to speak to the first year students at the beginning of Design Therapy. He introduced a trip to the first year students, named after the lake where the event was traditionally held. This had been a program tradition for at least four years, and was generally spearheaded by leaders in the second year cohort. Adam provided a brief explanation of the trip, explaining that it was not a time to discuss classes, to do project work, and it was absolutely closed to anyone outside of the program (Figure 19).

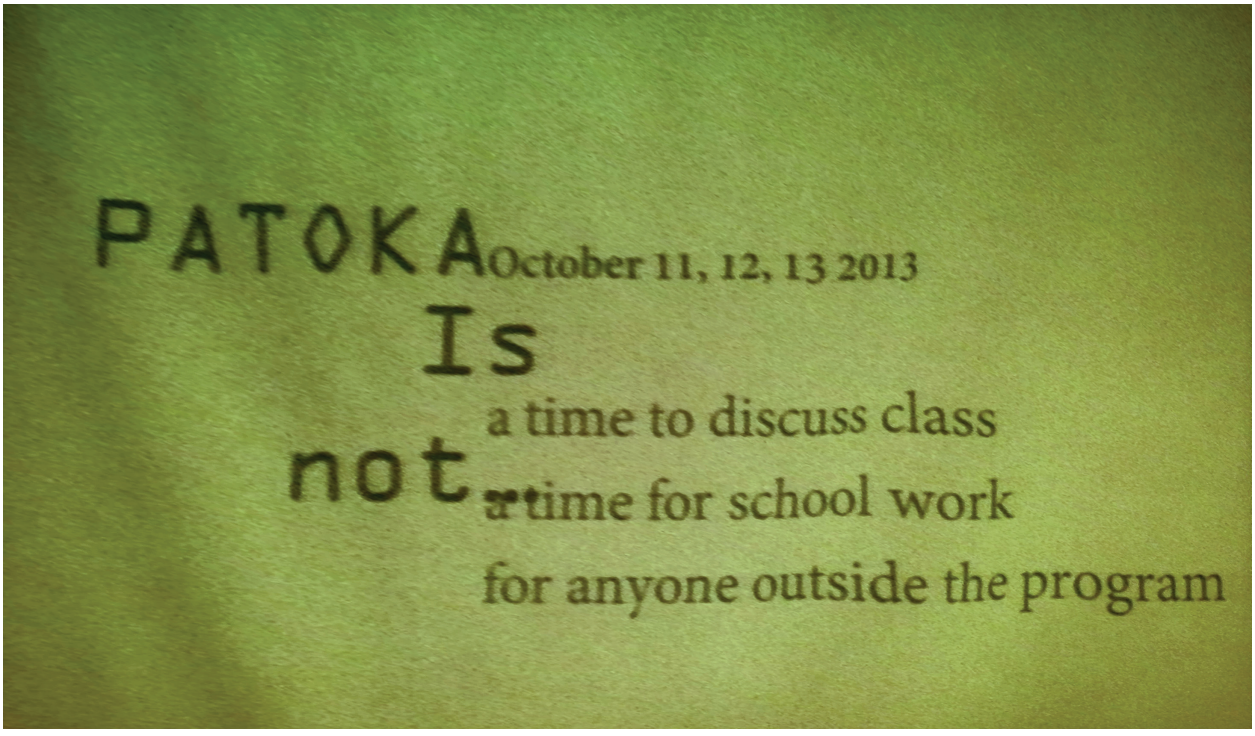
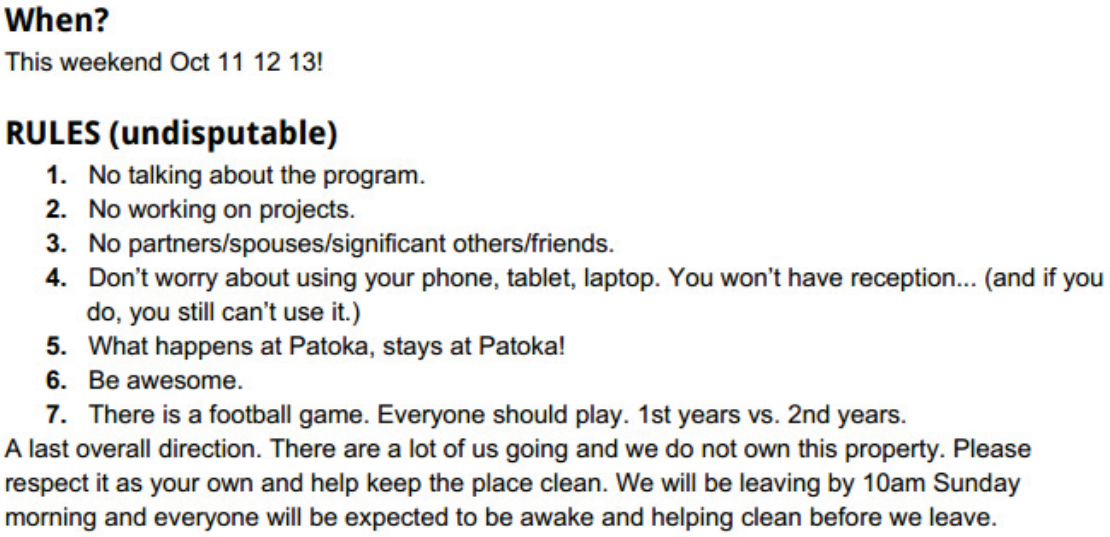


Figure 19. Powerpoint slide introducing the weekend trip.

The event was to be held on October 11-13—a Friday, Saturday, and Sunday—in a remote cabin, many miles from cell phone signal. This location was intentional; to force the students to bond in a place that was away from technology, and the related pressures to do coursework. The rules were clear (Figure 20), disseminated through a Google Doc in advance of the trip, and posted on relevant Facebook groups. Slots for each cohort filled quickly after advance notice of times for sign-up and payment on Facebook, with over 40 students committing to attending the event over a long weekend. Many students stayed for the entire weekend, and others only attended for portions of some of the days as schedules allowed.

When the event was initially introduced, first year students balked at the requests for no technology and cell phones. Adam replied, "leave all that stuff behind; that's not what that weekend is all about…it's literally just students, no faculty allowed." (09052013, Therapy). The events of the weekend are shrouded in mystery, with few hints to what occurs beyond the football game, drinking, and time away from coursework. While the professors did not directly legitimate the event, they were also aware of its occurrence, with Marty directly mentioning that it was not a school-sponsored trip during one class session.



When?

This weekend Oct 11 12 13!

RULES (undisputable)

1. No talking about the program.
2. No working on projects.
3. No partners/spouses/significant others/friends.
4. Don't worry about using your phone, tablet, laptop. You won't have reception... (and if you do, you still can't use it.)
5. What happens at Patoka, stays at Patoka!
6. Be awesome.
7. There is a football game. Everyone should play. 1st years vs. 2nd years.

A last overall direction. There are a lot of us going and we do not own this property. Please respect it as your own and help keep the place clean. We will be leaving by 10am Sunday morning and everyone will be expected to be awake and helping clean before we leave.

Figure 20. Official rules for the Patoka trip.

Mad Skillz Club

As the activities of the semester fell into a steady rhythm, the second year students began to implement some of the events that were traditionally student led. Once the weekend away was complete, Stephen restarted what had been a program tradition for at least four years—a informal group that shared techniques and skills in a peer-to-peer context. This venture had been called "Mad Skillz Club" since before I entered the program in 2010, and had gone through several different iterations, leaders, and formats over the years.

Stephen, a second year student, was at the center of the Mad Skillz planning process. He had led some of the efforts for this group the previous semester and formalized that participation in the creation of a Facebook group explicitly for group event notifications (Figure 21) in mid-October. Throughout the remainder of the semester, this group was used to announce at least six different events, held in the design studio space. Stephen organized the majority of the sessions, but Liz, Sarang, and Matthew also participated and helped to host some of the events based on their interests.

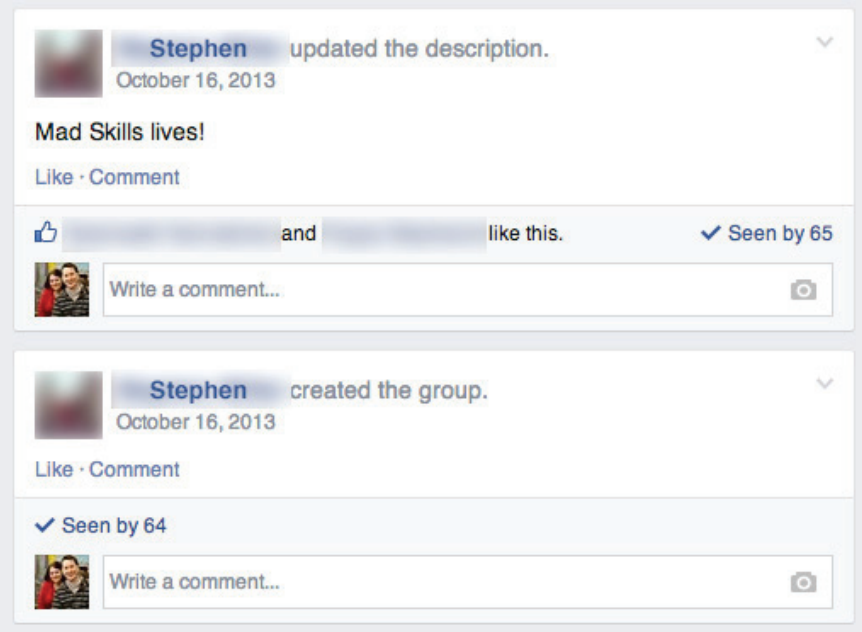


Figure 21. Inaugural messages for the new Mad Skillz Facebook group, posted by Stephen.

These events were attended by varying amounts of students based on the topic and availability of students, with a substantial portion of the attendees coming from the first year cohort (Figure 22). Sarang also held two different events—one on perceptual computing devices such as LeapMotion, and another in collaboration with a non-HCI student taking IDP focusing on the Oculus Rift. Neither of these events were marketed directly as Mad Skillz events, but followed a similar template of marketing through the Facebook groups and attendance by an exclusively student audience.

Figure 22. Students interact at a variety of Mad Skillz events held in the studio.

Crises and Threats

By late September, there were competing messages swirling around the studio space about the 2015 cohort in comparison to previous cohorts. The introspection and

shyness of the first years was read by some as a commentary on their commitment to the program, and they seemed to be judged as deficient before they had a chance to create their own unique cohort identity. While the second year students were well meaning and energetic, they tended to "steamroll" the first year cohort, limiting the introduction of norms of informal communication between the first years in an organic way.

First Years: Crisis of Identity

First years felt that they were being compared to their second years and found wanting. They didn't feel like they knew how to get better, and even while they were floundering in their attempts to improve, they were being told that opportunities like mentoring and Marty's rapid design course—communicated as *the* key to getting a good job and being a successful designer—would be closed to them. The first year students infrequently asked for critique outside of the formal classroom structures available to them (Figure 23 as a rare example), and interacted with the second year students and professors primarily within an academic framing (Figure 24).

The first year students did not have a poor opinion of the second years—in fact, Alexis remarked that "it's amazing…they're just a year ahead…when you go to them, it's just amazing"; that feedback is even more powerful coming from your peers (Interview, 12172013). Danielle echoed a similar sentiment after I questioned her about the value of mentors: "they know what they're doing!" (Interview, 12112013). While these students understood that there was a substantial difference in expertise, others were more perplexed why this was the case; Brad, an infrequent participant in the studio, thought that the second year students were "brilliant, and I can't figure out why…" (Interview, 12132013).

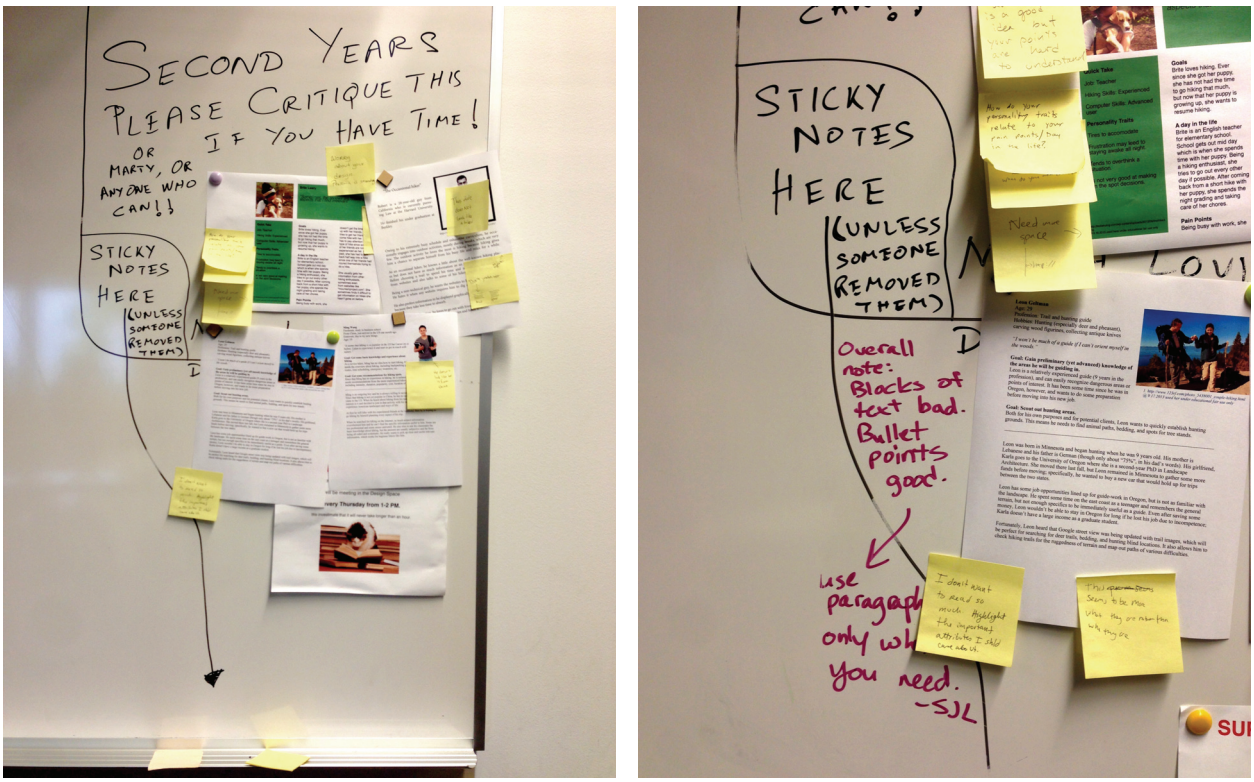


Figure 23. Request from the first years for critique of their persona profiles.

Figure 24. A mentor meeting with a team of first year students in the studio.

Although the first year students admired their second year counterparts, they also felt that the comparison between cohorts had "gotten old." Lulu remarked that she felt Marty was disappointed with them—that they were "not actively thinking about what we've learned…now we're disappointing, and that's shitty" (Interview, 12072013). Sanjiv was one of the few first year students that actively sought out talking to and learning from second year students, but thought that other first years were "resistant to talking with second years." He was encouraged to make those connections with the second years because he was told by Marty about his cohort, "you guys suck" alongside threats of him not teaching the rapid design course for them the following year (Interview, 12062013).

A fuller discussion of these comparisons that led to the first year cohort meeting are discussed in chapter seven. The lack of security around the first year students' position in the program caused a crisis of identity, both on an individual and cohort level—and the panic that resulted likely affected the quality of their work and quality of life. Some students took the threats seriously, and made changes as a result (like Sanjiv). Others thought they were empty threats, and while they recognized they needed to change, more explicit academic ramifications would be needed to encourage action.

Second Years: Lost Promise

The second years were able to talk about the progress of the first years during the mentor meetings for IDP. In one such meeting, Kent noted that from his perspective, students were "responding to criticism really well" (Mentor Meeting, 10022013). Troy presented a different view, saying that he wanted them "to fight for something" and start providing rationale for their designs (Mentor Meeting, 10022013). Emily was perhaps the most concerned and frustrated, telling the other students and Marty: "I want to help them, but they won't talk to me" (Mentor Meeting, 10022013). Emily expanded on this sentiment in an interview with me later in the semester,

explaining that "it's been very frustrating for me [mentoring first years]" because they had an attitude of not needing the mentors, and that not all mentors were trusted in the same way. She felt this was an expression of latent sexism, where many of the students "avoided talking to women and international mentors"; she was also disrespected by a number of the students when she taught a session of David's course in his absence (Interview, 12042013).

When Marty opened up the discussion in another meeting, scheduled during the break of one session of IDP, he asked the students for their advice: "what's going to help them? We can change the schedule." Adam thought that the students didn't have enough critique skills yet, and Matthew agreed, stating: "there's just not a critique culture here at all" (Mentor Meeting, 11112013).

Even though all cohorts go through a period of missing expectations, Marty led the narrative that these students were just "missing something." The mentors joined this critique, complaining of students resisting and not engaging them in the ways they wished to be used. Perhaps this was just a case of the second years misreading the panic and identity crises on the part of the first years, or a desire for the first years to have the same experience they did.

Professor: Feigned Rejection

Marty expected students to resist and experience frustrating moments each year in this course. As he explained to me during a reflection in the first third of the semester:

> *[They are] maybe resisting a little bit, which is to be expected…things are starting to pile up and become more intense. People respond to the pressure by picking up the shovel and digging the hole deeper…no, they really need a different strategy. We are really building up to project three…where in some sense, I am expecting actual meltdowns to start to occur. Project three is going to be about identity—what is identity—one could spend a lifetime on this project.* (Reflection, 09242013)

As the semester progressed, Marty's assumption that this cohort was on a similar course as previous cohorts, explicitly stated during some of his early reflections, shifted to a frustration:

> *What is most frustrating to me with this particular cohort is their unwillingness to ask questions…I think by this point cohorts [in the past] were much more eager to ask questions…you know, I wish someone would say, 'I'm still confused about this core thing.' I don't know why they're unwilling to say that, even when they are…maybe in their own mind they're not confused until they are pushed.* (Reflection, 10212013)

This sentiment echoed through several other reflections during the semester, as Marty attempted to explain why this cohort was not reacting in the ways he would expect based on past experience. He reiterated to me several features of the course that were meant to encourage participation and self-reflection on the part of the students. For instance:

> *You know I think these things just happen [the harsh critique], and it's just part of the nature of this course. I think it shook a lot of people up. And hopefully in a good way.* (Reflection, 11042013)

> *The turning point is occurring. They—oh my goodness—project four is a pretty complex problem from CHI, dealing with body data and understanding what is body data and how to incorporate that into design…it's just a very complex challenge. They're still learning how to work in teams and schedule their work and be more efficient. You take an extremely hard problem and you push it against these developing skills and a crisis occurs. But through a series of discussions with them both on a group level and individual level, I think they are now exhibiting behaviors that take responsibilities for who they are…we can't just be passively waiting there.…I'm trying to get rid of that passivity…I talked to several people that said, I tend not to be the leader.* (Reflection, 11182013)

While recognizing some of the difficulties with the cohort, he also recognized some of the social dynamics that might have caused these issues, including an introversion of students, complicated by a lack of participation in the studio.

> "I think this cohort in particular has had more difficulty stepping out and standing up for themselves. There doesn't seem to be really anyone that is modeling that very well; there are a lot of very smart people, but they are more introverted…and the [second year] cohort is a very powerful cohort…they just can't help themselves, they have to jump in." (Reflection, 11182013)

After showing a video clip of Leonard Bernstein conducting a segment with a frustrated José Carreras in class, Marty reminded the students: "these are people at the top of their game—understand that." Then, Marty linked this clip back to the first years and the changes they were experiencing, telling them their response should be "I don't want to be this way anymore." He then provided a solution: "if you're around [in the studio], you'll see what they [the good students]

do…you've got to persist through the pain…you don't get to be Leonard Bernstein by sitting on the sidelines." This is one of several explicit comparisons between the first and second year students, using a comparison between isolation and collaboration (10172013, I541).

I think Marty thought of this comparison tactic as "tough love" or a way of visualizing who they might become. None of the mentors seemed to take his threats of taking away the possibility of mentoring or participating in RDSC quite seriously, although the first years did in a relatively uniform way. Marty seemed to almost relish the panic this stirred up, likely assuming that it would result in a stronger cohort that was more outgoing, with a stronger leadership. In the background, he countered this gruff exterior by quietly meeting with leaders of the first years to try and get them to organize a cohort meeting to work through their issues.

Professor: Tests and Making Connections

As the semester progressed, students also took a series of three difficult tests in David's readings course. While there were parallels to be drawn between the two courses—IDP and I542—neither professor made explicit references to the other course in their lectures or materials, and no integration of projects or course materials existed. David reflected on how this knowledge gap might be seen in the design activity of first year students:

> *It is less clear how well they [the first year students] can see their own design practice in relation to this theory. It does not appear to be the case that it has occurred to anyone to take this knowledge into IDP. Thus, no matter how many readings they do that emphasize empirical study of actual people in actual situations, I don't see much evidence that students are trying to do that (as opposed to short behavior-oriented surveys of their social media friends).* (Reflection, 10202013)

David felt this was the case "because there is little scaffolding for it. I don't do enough to spell out the design methodology implications for them and their own practice—which I am trying to do more of—and as far as I have been able to discern, HCI theory has no place in IDP whatsoever and

thus the potential connections between the courses do not get reinforced in that class" (Reflection, 10202013). David was also surprised that students did "better than I expected" on their first test of the semester, which he thinks was a result of "the current second years scar[ing] the bajeebus out of them" (Reflection, 10142013).

Despite IDP and I542 existing side-by-side for five years, no explicit connections existed between these courses. As mentioned earlier in this chapter, the discourses on design between these two courses are quite different, and students did not seem to actively attempt to connect the two in any meaningful way. This connection was made almost impossible since the two professors did not incentivize or build scaffolding into the program, allowing for sharing of knowledge between the discourses to take place.

Professor: Town Hall

At the end of September, Dwight organized a town hall meeting, with required attendance for all first year students. He had held a similar meeting for the second year students the previous week, but since invitations were only sent out via cohort listservs, I was not aware of that first meeting until after it occurred. The meeting was held on Monday evening at 5:00PM, with the department providing pizza for the students to eat.

Dwight introduced the purpose of the meeting, telling the students that he wanted to connect with them and ensure that he was in touch with them before he had them for class the next semester. In addition, he said he wanted "to make things run smoothly, and make sure you graduate with deserving work" (Studio, 09302013). He directly contrasted himself with Marty, saying "it's not my job to be your best friend…but feel free to talk to me any time you want, in confidence" if you have any issues with the program or professors. In his role as head of the program, Dwight said: "we need to get the standards to be higher," mentioning several initiatives, but saying it "needs to expand way beyond that." Ultimately, he said he wants to hold a "class

event the way it is in design schools" as opposed to other events that aren't really official, and are just "fun." He also made several statements about the program; regarding the capstone posters that are hung in the studio, he told the students that they are the "thing you'll be most proud of when you leave here"—something that has commercial value…that's where the school's reputation and standards lie." He also told students that "everybody loves [IDP]…but that's not the whole picture of everything that goes on here"—there is also a focus on visual skills, theory, scholarship, and entrepreneurship.

Cohort Meeting

This event was likely the high and low point of the semester. Marty was able to get what he wanted in getting the students to meet, without him being seen as the center of the meeting. This also seemed to serve as an internal vote of confidence for the students that they were able to be successful. The meeting was scheduled during a required second year course, and minimal efforts seem to have been made to include outsiders. I was unaware that this was happening until after the fact, and it took me several interviews and discussions to piece the events together. A fuller exploration of the event itself is included in chapter seven, including the implications of this event for the broader social system of the studio and program.

First Years: Resolved…

Late in October and early in November, Marty began meeting with some of the first year students, going out for lunch or talking in his office. During these meetings, Marty encouraged these students to not just be passive, but to emerge as leaders in their cohort; as Marty shared in a reflection with me: "I'm trying to get rid of that passivity…I talked to several people that said, I tend not to be the leader" (Reflection, 11182013). By the middle of November, several of these students that Marty had talked to joined together at a local bar after class on a Thursday night, and

made the first preparations to hold a meeting of the entire cohort—student initiated and student led.

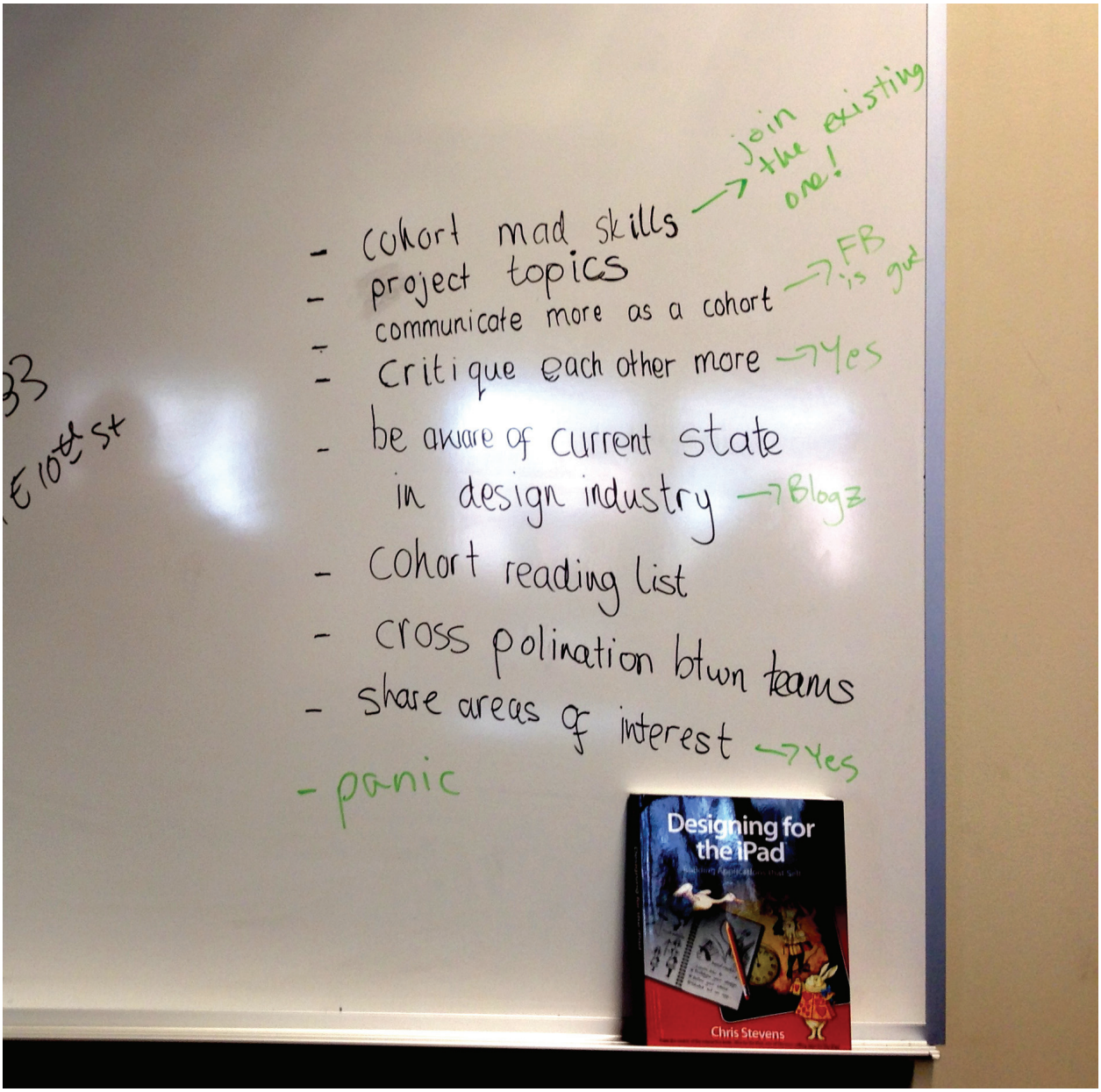


Figure 25. List of desired outcomes from the first year cohort meeting.

The meeting was held on a Monday afternoon while second year students were still in class. During the meeting, the students came up with a list of commitments—to each other and to themselves—about how they should act and in what ways they needed to improve (Figure 25).

Over 30 members of the cohort were present, and several of the students that Marty had encouraged to be leaders over the previous weeks led the meeting together. These commitments that the first year students made remained on one of the whiteboards in the studio, stripped of context, for almost two weeks after the meeting.

Although lasting changes from the first year cohort were not seen immediately by either Marty or the second years, the first years finally seemed as if they could stand with their heads held high. They had successfully talked through their issues, and confronted the changes they needed to make. To me, they seemed confident for the first time since they had entered "Zen Dog's boat" early that semester.

Second Years: Mentor Confliction

The second years were largely unaware that this meeting had taken place, even with the vague commitments present on the whiteboard in the studio. Many of the mentors were frustrated that students were not meeting with them or making adequate progress. As Valerie, a mentor, explained to me in an interview, the first years had a "lack of respect" towards the mentors and second years; in her cohort, they had encountered a "rigid hierarchy" between their second years that they didn't like, and so they had tried to make the environment more conducive for collaboration between cohorts. She felt as if the first years were finally beginning to bond, but at the cost of hierarchy and a lack of respect (Interview, 12102013). Emily was similarly frustrated, telling me "I have this love in my heart for this program…a culture of: we help each other"; but she felt as if she was not being valued by the first years, and this meeting did nothing to change that. At the end of the semester, she still felt that "I would like to command more respect than that," while simultaneously saying "I want *so* much to help the first years" (Interview, 12042013).

Consummation of Experience

The semester grew toward a climax, with the students engaging in a design challenge for their last two assignments in Marty's course. The design brief for these projects had been drawn from the ACM SIGCHI Student Design Competition for a number of years, and was known for being a difficult problem to solve, even for expert designers. As Marty explained in a reflection, the environment in which this prompt emerged was tenuous:

> *The turning point is occurring. They—oh my goodness—project four is a pretty complex problem from CHI, dealing with body data and understanding what is body data and how to incorporate that into design…it's just a very complex challenge. They're still learning how to work in teams and schedule their work and be more efficient. You take an extremely hard problem and you push it against these developing skills and a crisis occurs.* (Reflection, 11182013)

Alongside this complex design brief on designing for body data, students were able to choose their own teams. The CHI design challenge was well-known in the program, and several teams from the previous cohort had been accepted to present their projects at the annual international conference.

Professor: Finding the Why

Marty worked with the students in class, encouraging them to locate a context in which to approach the CHI prompt. The previous project, focused on thinking about one's digital identity, had stretched students to define a problem space and create a design within it, and teams had been met with a very harsh critique in several cases. To push students further towards framing their problem space, Marty encouraged students to find the "why" of their project, drawing on a Simon Sinek TED talk he showed the class. He told the students that sketching and secondary research is useful, "but at some point, you've got to leave that studio…find them, find those people. Don't give them a survey; find them—live with them" (11072013, I541).

In the next class session, he reminded students that the tools they had to find the "why" were through the team protocols he had taught them: "you can't have a great project without having great team interactions." He was made aware via the mentors that students were having issues in their teams, and he mentioned the voting protocols he required them to use, reminding

them that their vote is representative of their power in the team; "if you don't like the way things are going, ask for a vote. You can ask for a vote at any time…you have to be honest with each other and listen to each other." To some of the students who tried to distance themselves from their project team, Marty said: "that excuse doesn't work"—the mentors and he will help them; if it is left unresolved, it will lead to "a career where you will be stepped over all the time…I'm not yelling here, but I just want to make a point." If the students don't take this seriously, "the projects will be messed up and no one will go to CHI—and I don't care." (11112013, I541)

Early in the CHI projects, Marty became frustrated with students not being able to locate the "core" or "why" of their projects, and issues of group dynamics were the focus of his attention. While he reminded students that they had resources available to help them, he also distanced himself from a poor outcome, seemingly as a way to motivate the students even more.

First Years: The Design is Within the Designer

While the first year students worked through the CHI problem, there were significant issues in the use of team protocols for voting, and in fixation around specific ideas on the part of individual students or entire teams. After each team presented their early concepts for the project at the conclusion of project four in mid-November, most teams felt as if they knew what additional work was needed to finalize the project in the last weeks of the semester. In class the Thursday before a week of fall break, Marty engaged the students in a lecture about a zen raku potter instructing one of their students. He had brought a seemingly intact and expensive pot to the class that day, carefully unwrapping it and displaying it to the students, talking about how proud the fictional student was of their design:

> *To show off their first pot and to say, 'Look, I finally did it. This is my first design. This is my pot. I've been through this violent process of heating and cooling and heating and cooling and it survived!' And with great pride, the student shows the teacher their pot. The teacher takes the pot and looks at it, and says hmm, beautiful pot [as he smashes it to the floor].*

> *The zen raku teacher breaks the pot to teach a very important lesson to the student. The lesson is that is not your design; your design is inside of you. You can break pot after pot after pot, but what I can't break is what's inside of you. What's inside of you is your true design. And you can recreate it again and again, maybe looking somewhat like the pot that got broken. Or maybe even more beautiful. A different shape.* (11212013, I541)

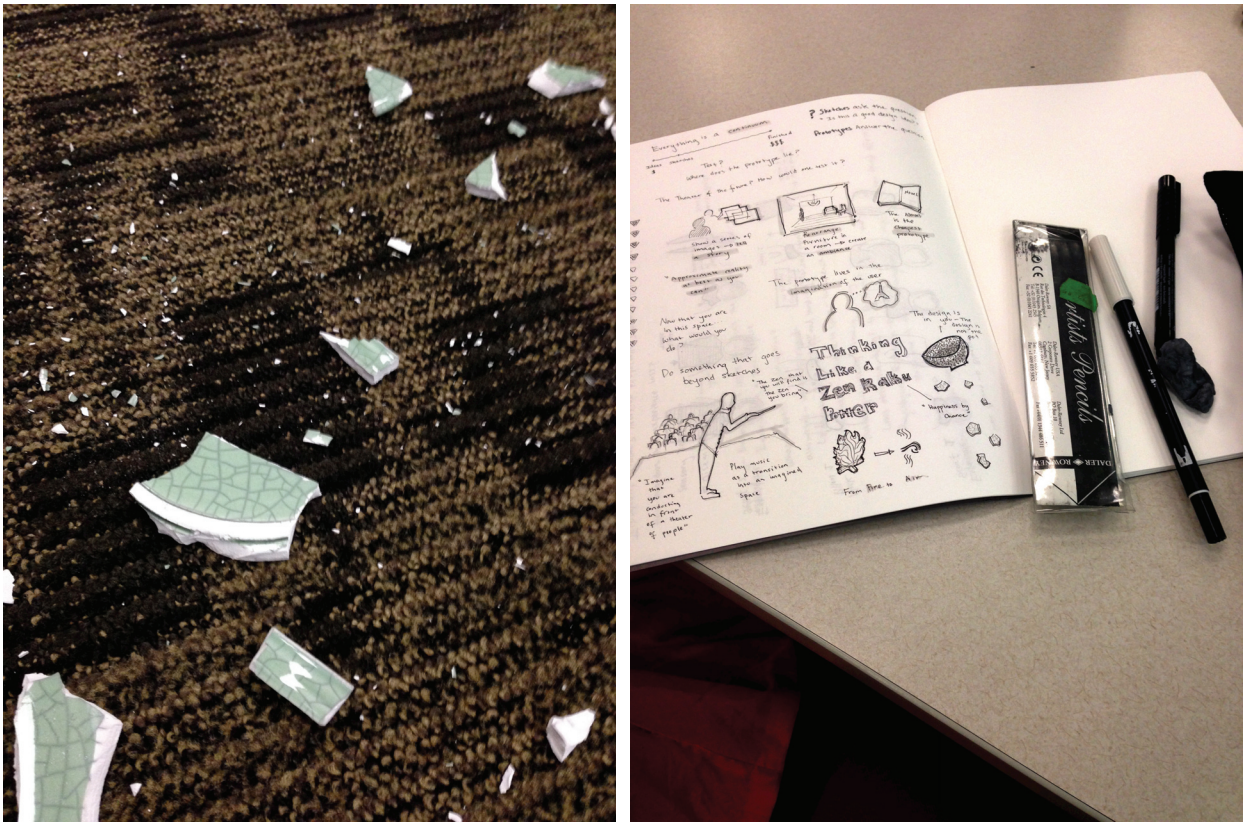


Figure 26. The broken raku pot on the classroom floor (left) and a student's sketchnote of the event (right).

After the shattering of the pot on the floor (Figure 26), Marty then led the students back to the relevance of this for their development as designers, encouraging them not to become fixated on their design, and to remember their identity as a designer.

> *So what's the analogy to design? The zen raku potter doesn't become attached to any particular design. The design is not the pot. The design is within the designer. The generation of multiple sketches we create in interaction design allows us to explore the design we have within us. That's what our sketches are. That's what our prototypes are.* (11212013, I541)

This analogy did not end with the identification of the student's identity as a designer; Marty then challenged students to take action:

> *This is where the values come into play…do we believe in this? …I challenge you to come up here [dragging trash can into the center of the room], to take your designs on paper, your sketches, your most final "finished" sketches. Rip it out of your notebook and shred it in here. Who is willing to do it. Who wants to do it?* (11212013, I541)

Many of the students responded to Marty's challenge, and the sound of ripping pages filled the room as sketches were torn out of notebooks; as students came to the center of the room, ripping their project four sketches into pieces in the trash can, then picking up a small fragment of the raku pot off of the floor as a token of this lesson.

Marty used this lecture, as he does each year, to remind the students of their value as designers—that their identity inside is more important than any design they might create. There was almost a religious fervor demonstrated in this lecture, with students possibly feeling pressured into desMatthewing their sketches, even if they did not want to take this drastic step. After all, these sketches represented weeks of work, and for many of them, these sketches were the basis of their final project.

Second Years: The Role of Prototyping

During critique of the final project five presentations, one of the teams presented a solution for firefighters to navigate in a burning building where visibility might be poor. To work through their design solution, the team built a physical prototype (Figure 27, left) and used the resulting design—strung together with jumper wires and powered by an Arduino microcontroller—to test the feasibility of their design. In parallel with this exploration, many of the second year students were building their own Arduino-powered projects for Mei's prototyping course, and Cameron, the first year doing most of the construction work, was encouraged by other students to create the prototype.

However, when the team presented the project in class, using the physical prototype to demonstrate how the design would work (Figure 27, right), they received a negative critique from Marty, where he claimed that this prototyping activity "takes time away from doing fundamental design work" (12092013, I541). The second year students, forming their own critique in a shared Google Doc during the formal classroom critique didn't see things the same way, with Troy and Valerie disagreeing in the Google Doc chat. Troy said: "I think prototyping is fundamental design work in some ways. I totally get Marty's critique, but I don't think it's necessarily a bad thing they built something—but I'm biased." Valerie disagreed from another standpoint, including personal knowledge of the construction process: "I think prototyping really informed them and helped them situate the design. But I see what he is saying. The prototype only took Cameron a day [to build]" (12092013, I541).

Figure 27. Cameron building the physical prototype (left) and Alec wearing the device during the final IDP presentation (right).

This difference of opinion on the relevance and appropriateness of physical prototyping activities increased the distance between the two discourses on design introduced earlier in this chapter. While the second year students were being encouraged to physically build prototypes as a way of thinking about and enacting design, Marty was indicating to the first year students that this kind of constructive activity was not relevant in the early and intermediate design stages. The mentors were left in between the two discourses, understanding Marty's position, but also disagreeing with his conclusions.

First Years: CHI and Beyond

In the final week of class, the presentations of the final project were completed. Marty and the mentors discussed the possibility of submitting their projects to the official CHI student design competition, and the commitment it would take to formalize their design work, do human subjects approved user research, and then write a paper for submission in early January. Adam, who had successfully led a team to CHI the previous year, told the students: "it's tough to do CHI, but it's a really fulfilling experience." Marty agreed with the challenge, encouraging students to move forward if their team wished and offering his support, but also clarifying that "moving forward is an individual decision and is not part of this class" (12092013, I541).

Throughout the semester, Marty had used videos, audio clips, and other devices to tell the story of several design disciplines, and their relevance for interaction design. These included work from graphic design, screenwriting and pre-visualization for filmmaking, architecture, and instructional design. To end off the class on the final evening, Marty played back a video focusing on the connections that had been made in the class, set to fast-paced music with hundreds of photos of the students interacting with each other. At the end of this montage, as with the beginning video of the semester, he presented his narrative of the course, with one line of text displayed at a time over a soulful tune set with string and piano:

Good design is about connections…
connecting each of us to one another…
you to me, and me to you.
Each of us to one another.
These connections form community that can help change the world…
one design at a time.
It is our responsibility.
All of us are in Zen Dog's boat.
Thank you for taking a risk this semester.
Each of you is a little miracle to me.

After opportunities for the students to reflect on their experiences, Marty concluded the course by reading a poem called *Come to the Edge* by Christopher Logue:

Come to the edge.
We might fall.
Come to the edge.
It's too high!
COME TO THE EDGE!
And they came,
and we pushed,
And they flew.

And then for the last time, ending the course as it began, Marty rang the small cymbals (Figure 28), leaving the room silent with the penetrating chime that died away slowly (12122013, Therapy).

Figure 28. Marty ringing a set of cymbals to mark the end of the course.

SECOND YEARS (2014 Cohort)

While the first years had their own cohort-centric narrative, often intersecting with the second years/mentors, the second years also had their own unique narrative, albeit more solitary in nature. This narrative documents the only experience for many of the second years that were not mentors (and thus, intersected with the first year cohort), and presents a narrative privileging the second year perspective for those serving as mentors as well.

Mentors, Reporting for Duty

The excitement the newly promoted second years felt about being promoted to mentor status was electric. The first time many of the second years had seen each other after a long summer of interning around the country and the world was at a mentor organizing meeting held at Marty's house.

Second Years: Change in Role

The end of the previous semester had climaxed in a promotion from first year to second year status in an emotional "rite of passage" ceremony, but the mentoring role brought a whole new set of challenges. Around 15 students were selected to serve as mentors for the introductory design course—all chosen by Marty based on their performance the previous year in his class, their innate ability to teach or explain, and how "bought into" the program they were. The students chosen as mentors wanted not only to help their fellow students, but also to provide good role models to look up to, and ultimately "raise the standard of the profession" (Emily, Interview, 12042013). While there was a certain amount of power within the mentor role, there was also a chance to reflect on one's own development as a designer. As Valerie noted, mentoring "makes me laugh at the things I did [as a first year]" and simultaneously realize that "I'm not there now" as a professional designer (Interview, 12102013). Valerie was also concerned about "doing it wrong—hindering their development," explaining to me that another mentor was seen as "too much of an

asshole, and they [the first year students] don't respect this." Adam felt a similar tension as one of the paid AIs for IDP, where he took on much of the administrative work of the course. One of his biggest challenges was avoiding "preteaching" concepts that would be covered in later courses, and thus not "stepping on another professor's toes" (Interview, 11212013). Additionally, he was working against what he saw as a cynicism or resistance in the first year cohort, and was surprised to see that "IDP is so surgical" in the way Marty deals with issues as they crop up during the semester.

Even though students were warned about letting the change in role get to their head, there is a very real sense that you are imbued with authority. Those that were selected as mentors "owned" the studio, the critique sessions, and often the limelight; even if it was unintentional, the power relations of the mentors towards the first years was heightened, setting the stage for tensions later in the semester.

The mentors met at several points during the semester to talk about the course, divide up responsibilities, and address any emergent problems (Figure 29). These issues ranged from developing a grading rubric for projects, to discussing whether any students were "poisoning" the cohort and not fully buying into the program. These meetings not only validated the status of the students as mentors and co-teachers in the course, but also gave them a space to reflect on their development as a designer. As Matthew explained in an early mentor meeting, through the mentoring experience: "I've learned how far I've come, and how much further I have to go" (10022013).

Figure 29. Mentors meet with Marty to discuss issues relating to the course (top and bottom left); mentors collaboratively develop a grading rubric for a project during a meeting (bottom right).

Second Years: Those Left Behind

Even while many of the mentors were excited to be in their new role, the majority of the cohort—over 20 students—were not selected. For some, this was a choice; they didn't believe in the mentoring system, did not have time or patience to engage with first years, or wanted to retreat from the cohort as a whole. But others were simply not accepted during the application process. Marty had asked for anyone considering being a mentor to fill out an application the previous semester, and while many individuals applied, some did not make the cut.

The mentor selection process can almost be seen as a "kingmaking" event on the part of Marty, giving students the power of being in his "inner circle." While none of the students he selected seemed to abuse this power, it is important to point out that the first year cohort is primarily shaped by this curated set of students—the same students who led many of the student initiatives such as Mad Skillz Club in the cohort.

Professor: The View From Within...and Without

Marty had taught a course similar to IDP for over two decades, and early on, felt the need for a lower ratio of students to instructors. This mentoring system was his way to not only lower the load of teaching such an intensive course—including grading, participating in meetings, and one-on-one mentoring—but also to further the development of what were still relatively "green" designers who now thought that they knew it all, after completing a summer internship. Only three of the mentors received paid assistantships, but all mentors were assigned virtually the same amount of work, leaving Marty with primarily administrative duties—lecturing, meeting with teams as the ultimate power broker, and signing off on final grade distributions for each project. He also had to keep on top of what were often complicated politics within the group of mentors, including dealing with a relationship that emerged between a mentor and first year student, for instance.

Outside of Marty's control in IDP, some professors saw the mentors as a potentially destructive pedagogical force. None of the other faculty directly engaged with the mentor system, but due to an experience several years previous where some mentors had shared notes on design methods from a class those first years had not yet taken, mentors were warned by Marty not to "preempt" other faculty or courses in the program.

Building "Shit"

For the second years, the challenge was to do a lot of design work...and fast. Many students had successfully lobbied the program head the semester before to opt out of the

previously required course on graphic design so that they could take two different electives alongside their required prototyping course. As a result, courses on design theory and rapid design each enjoyed high enrollment, with the majority of the cohort enrolled in both. This set up an early challenge for the students, and on a more latent level, the professors of those courses.

Second Years: Making, Building, Designing

In the required prototyping course, Mei set out a vision for the students—of a design process oriented towards thinking about design by making and building. For most of the students, who had little if any background in constructing physical prototypes, this was an exercise in endurance. They constructed prototypes with items like pipe cleaners, hot glue, foamcore, and old toys, which filled their "office-in-a-box" that Mei required them to construct. The previous year of coursework, Mei's course on design and research methods excepted, did not set these students up to think in terms of physical construction as a way of doing or thinking about design. In fact, Marty's conception of the "whole game" as manifested in IDP rarely, if ever, talked about the role of making as thinking about or doing design.

Figure 30. Students interact with their egg carrier prototypes in the studio (left); cardboard boxes and supplies collect in one of the back hallway areas (right).

The student projects from this course quickly changed the shape of the design studio, with carriers designed to protect eggs from a fall (Figure 30, left), the creation of squishy toys for emotional prototyping, and lots of materials to facilitate the production of physical prototyping (Figure 30, right). In class, the large classroom on the main floor took on the look of a hackerspace or traditional design studio, with physical prototyping tools, old toys in need of repair or appropriation, and other materials a common sight (Figure 31).

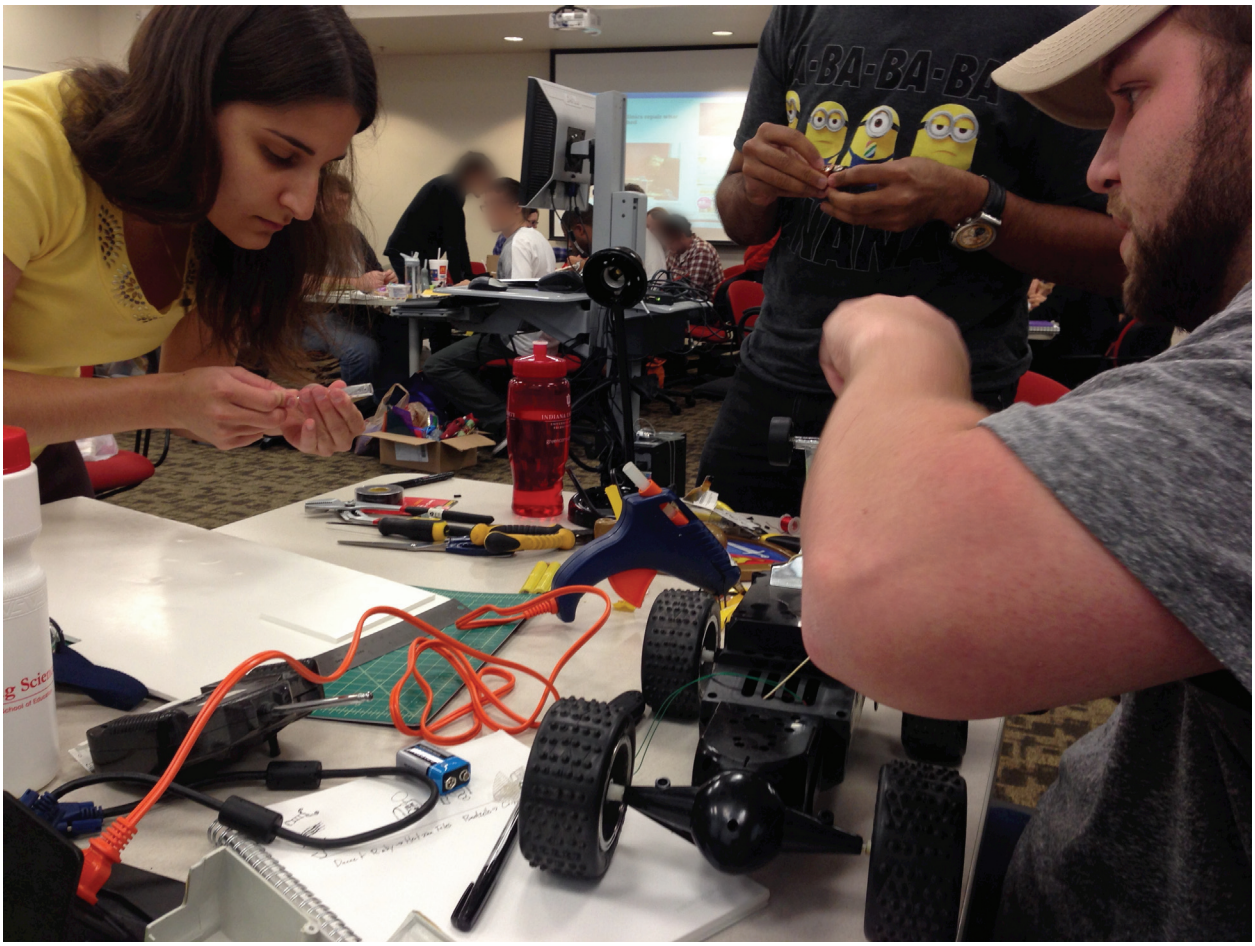


Figure 31. Students work on fixing a toy using ready-at-hand tools and materials during class.

At the beginning of the semester, low-fidelity prototyping with basic supplies like cardboard and foam dominated the space. But as the semester progressed, students began to work with

Arduino microcontrollers, once again changing the kind of development work common in the studio and the classroom (Figure 32).

Figure 32. Students interact with Arduino projects in the classroom (top left and bottom) and in the studio (top right).

"Building shit," as David often referred to it, was the nexus of the prototyping course. And the dynamic of the studio quickly changed to accommodate this new focus. Jumper cables, Arduino boards, and various wood and foam enclosures began to populate tables as students worked on their prototypes. Some of the second years were also extending their already burgeoning interest in this area by working with perceptual computing, using tools like the LeapMotion, Oculus Rift, and Intel's Perceptual Computing camera. Demos of these tools in the studio inspired many first years (Figure 33), who already seemed to have an interest in the capabilities of these technologies. This presence in the studio even began to sway some first year students towards prototyping for their design projects.

Figure 33. Students demoing an Oculus Rift virtual reality headset in the studio.

The students in this cohort were significantly more amenable to physical prototyping than previous cohorts that were only interested in learning wireframing skills. Mei communicated to the students that they are learning the "skills of tomorrow," and that work in physical computing is not yet appreciated in many areas of the HCI community. The 2014 cohort also had significant technical skills distributed across the students, which encouraged the development of physical prototypes of all kinds.

Professor: "Motivating the Importance of Materiality"

Mei began teaching the user research methods course in the HCI program in 2008, and starting in 2010, she began to spend a month of that course to do making, "since we don't make stuff…as a program" (Reflection Interview, 12162013). She began this making implementation with Arduino microcontrollers, and moved outward to more basic forms of physical prototyping over time.

In 2011, the program expanded to include a course entirely on prototyping, and Mei taught the course for the first time in 2012. Her stated goal for the course is to "give [students] an idea of the forest" through discussion of core issues and make sessions. She desires to continually push students forward, looking at emergent issues like: "what do you do when materiality becomes digital?"—how do you deal with these issues as a designer, especially through focusing more on problem setting than problem solving. Over time, this course has shifted towards issues of materiality, and Mei sees this course as an important component in "motivating the importance of materiality…very strongly." Unlike previous cohorts where this has been more of a struggle, she told me "I feel like I am more successful this year." Even with this expanded role of making in the program, Mei is concerned that there is not a sustained culture of making throughout the week, which she attributes to students being overworked, and not balancing their time equally across the courses they take; in her opinion, "faculty can do something to change that."

Crafting a Heightened Reality

Professor: More Opportunities for Practice

Marty had taught IDP since the beginning of the HCI program in various forms, but over the years, he recognized the need for students to have more opportunities to practice their design skills than that one course afforded. In 2011, Marty offered a course entitled "Rapid Design for Slow Change" or RDSC for the first time, incorporating his research interest in designing for slow change and a set of rapid, real-world projects that would be completed by students throughout the semester. Unlike projects in IDP, which were contrived and completed over three to six weeks, these projects would come directly from real companies and be completed by students in just one week. The project schedule roughly mapped to a workweek, with students working in a different team each week. The projects came from a wide range of companies, most with an alumni presence from the program. In this semester, almost all of the projects came from students working in UX departments that had recently graduated from the HCI program; and all of the recent graduates had taken this course, and once been in the place of these students.

Over the few years this course has been in place, the process of designing ten projects during a semester gained interest from the students; even with a heavy workload, Marty promised them that "this course gets you jobs" (12052013, RDSC). In a reciprocal way, Marty also saw this course as one of the clearest connections between pedagogy and professional practice, telling students after one client debriefing of a project: "that was awesome—that was worth the price of the class" (09242013, RDSC). To complete the loop of students and alumni, he also asked the students to "give back in this way" once they get a job in professional practice, mentoring students in the program and providing projects and feedback through the rapid design course.

Second Years: One Week, One Project

Marty's course on rapid design was incredibly intense, with a project due virtually every week. Students would receive a brief on Monday at noon, and by Friday at 5:00PM, the project

was due. During the week, students would generally receive a "curveball"—an alteration to the original project brief that changed the project or forced quick turnaround by the ad hoc design teams. Meanwhile, Mei's course operated on a longer time scale. Many projects were two weeks or more in duration, and these projects were almost always due on Sunday evening. So for many students, who did not work on the projects in parallel, Marty's course dominated the week, and Mei's projects were left for quick turnaround over the weekend.

The course itself was different in construction from IDP, and the first day, Marty introduced a staple element that would begin each class. He played essays from the This I Believe NPR series, with the following justification to the students: "it's easy to be isolated from real people…[these essays] project ourselves into others' way of thinking" which can lead to better design insights (08292013, RDSC). Students interacted with clients during a question and answer session that was held in a time-limited portion of the Tuesday class, giving them opportunities to get additional information on the prompt to inform their design activity. In addition, Marty also used these advanced students as a sounding board to talk about the development of the first year cohort. In one course, Marty mentioned the issues with the first year students, mentioning that he had lunch that day with Sanjiv: "they act not so different from you guys—which I think is interesting." Troy followed up on this, telling the class that "Sanjiv is always hanging around" and is shocked at how quickly second years are able to do design work. Marty tells them "you better!" and then shifted to his concerns about the first years: "I'm going to have to teach IDP without any mentors," to which the second year students audibly gasp; he then mentions he might only select 20 students for rapid design next year as well (11122013, RDSC).

This interplay between Mei and Marty's courses was seemingly never questioned by the students, even while Marty's course demanded more and more of them, physically and emotionally. Mei had learned over time that students would attend to the more urgent

projects in the rapid design course, as they saw more direct value in building their professional portfolio than the more speculative projects encouraged in her course.

"Hacking" Perceptual Computing

Second Years: Early Triumphs

Despite the challenges of balancing weekly projects and numerous prototyping assignments, there were also triumphant moments. As part of a large grant Mei and David had been working on with a major technology company, Mei organized a workshop using Intel's perceptual computing cameras. This included a normal class session from 2:30-5:00PM, followed up by dinner and a three hour "hackathon" for students to put the cameras through their paces. The technology company sent two top designers/managers to attend and help lead the event, assisting students in thinking through the capabilities of these technologies in terms of future design opportunities.

The first portion of the event focused on showing what the technology was capable of, with the leaders of the event showing off various demos including the camera capabilities, infrared sensing of distance from the camera, and facial and hand recognition. After a break, the students worked in teams to develop a concept that might be appropriate using this type of technological tool (Figure 34). The hackathon was an intense day. For many of the students who also served as mentors, it made for twelve straight hours of work, over six of which was devoted to the hackathon. Students struggled with the coding requirements of the libraries, and in many cases only got a small proof-of-concept running. But even though much of the formal success would be delayed until the end of the semester when the company representatives returned to judge the final concepts, Mei was thrilled with the results. Not one for effusive praise, she congratulated the students on their work, and for working on the cutting edge in this perceptual computing space.

Figure 34. Student teams working to formulate their concept (bottom left), testing their concept once code was written (top left and bottom right), and collaborating with other groups and the leaders of the hackathon (top right).

Second Years: Building Experiences

After the experience of building for the Intel perceptual computing camera, project teams in Mei's course turned back to focus on Arduino-powered projects. Students received assistance in learning how to use the Arduino microcontroller through two guest lectures by Austin, a PhD student in the program, and kits were distributed to each project team. After this introduction to the capabilities of microcontrollers, with a variety of sensors and outputs, the teams were left to design for a play experience. Teams frequently worked in the studio to build their projects (Figure 35), leaving a range of jumper wires, toy components, and the often humorous testing of the prototype to be experienced by other students of both cohorts. Students interpreted this prompt broadly, designing for sexual intimacy, appropriating portions of existing games, or creating entirely new digital overlays for analog games (Figure 36).

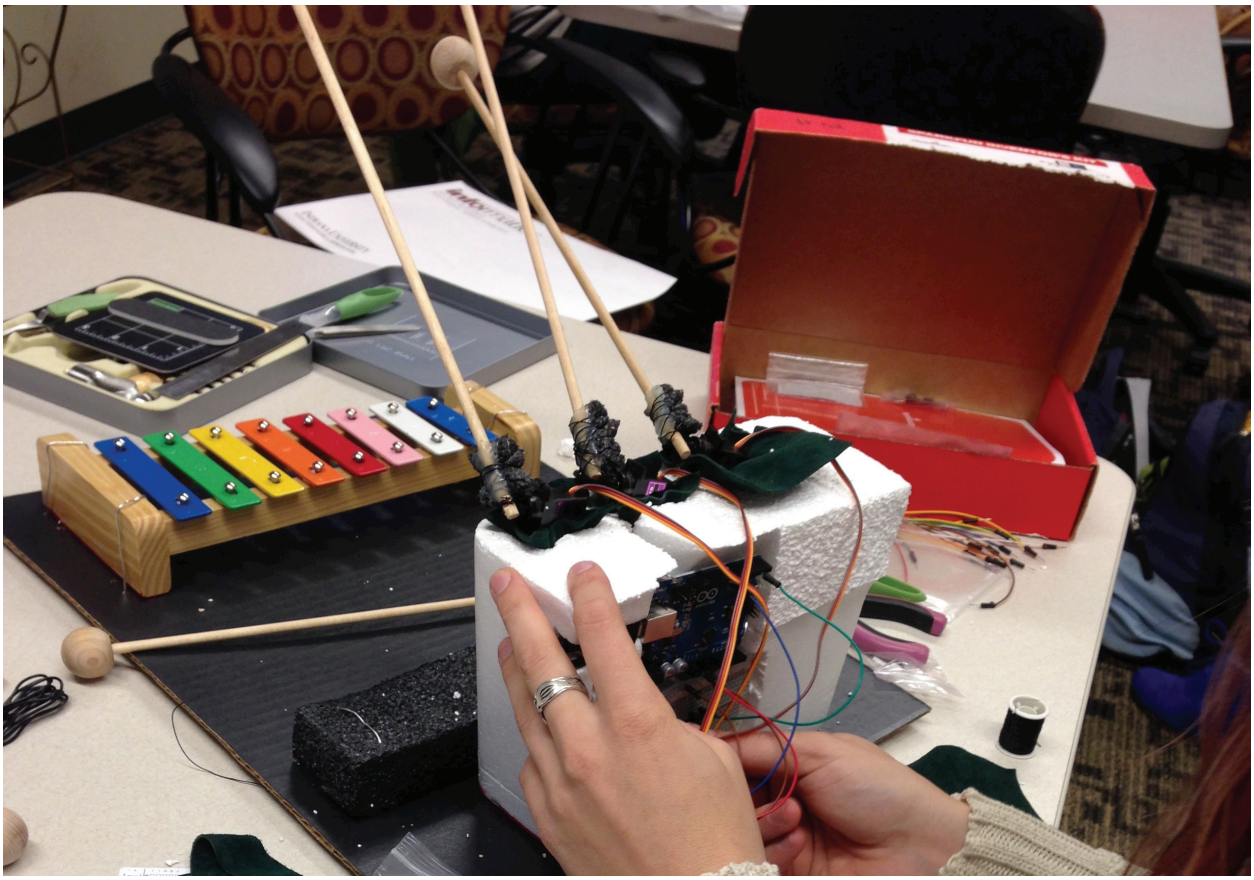


Figure 35. A student working on her team's Arduino-powered xylophone in the studio.

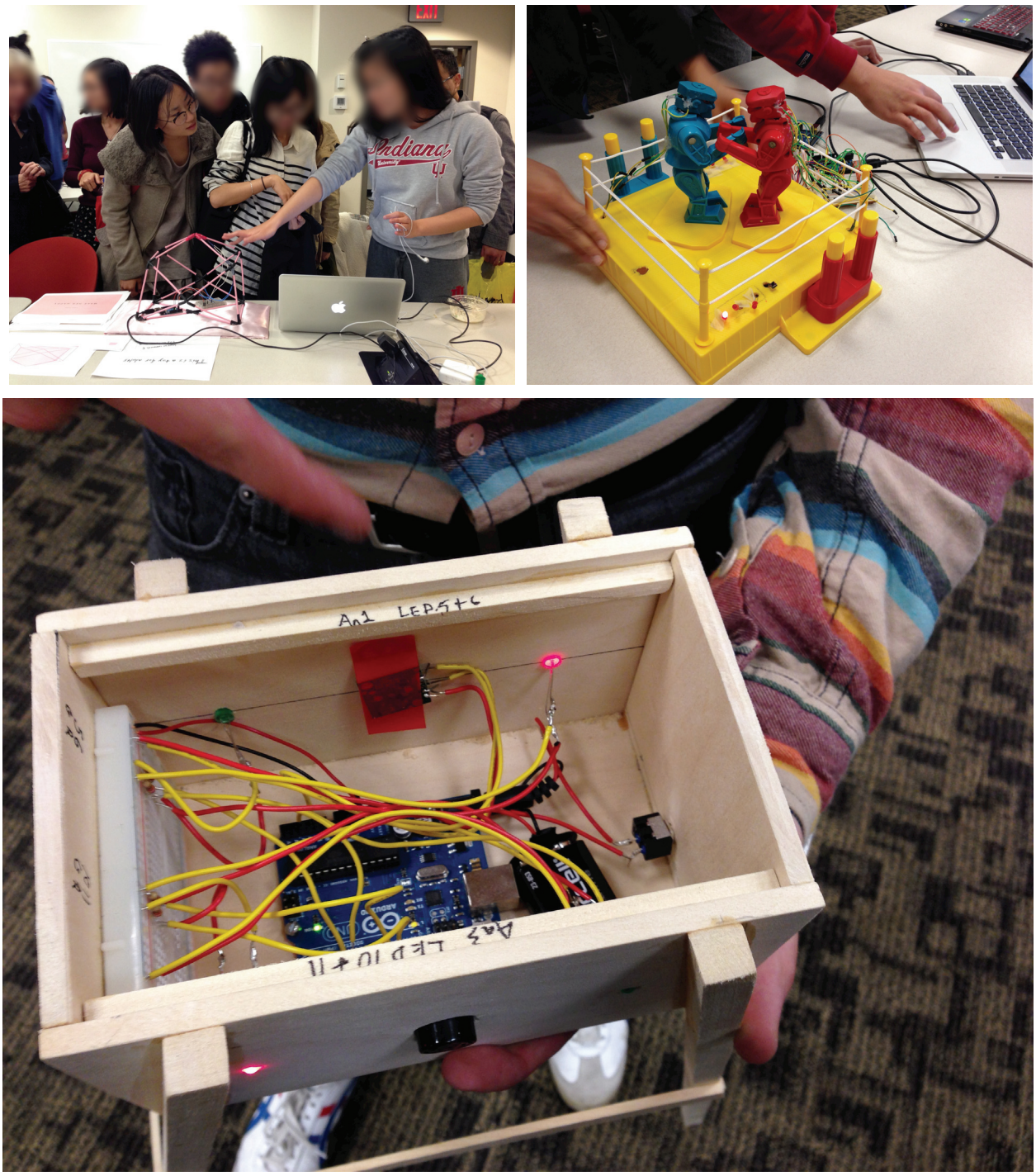


Figure 36. Students demoing their projects in a public exhibition; a device to encourage intimacy (top left); an appropriated game with enhanced functionality (top right); and the control box for a digitally scored cornhole game (bottom).

Second Years: Showing Off

These digital prototypes were developed for the class, but Mei opened up the class on two occasions for a public exhibition of student work—first for the Arduino prototypes (Figure 37), and then at the end of the semester for the perceptual camera-driven prototypes (Figure 38).

Figure 37. Second year students interact with guests in a public exhibition of their concepts.

Figure 38. Participants in the perceptual computing exhibition use the prototypes, ranging from a vending machine controlled through "the force" (bottom left) to a DJ system controlled with a user's hands (bottom right).

These exhibition experiences were an opportunity for students to share and explain their work with others, both in and outside of the HCI program. While the Arduino projects were centered around play, the perceptual computing designs were even more broad, with implementations ranging from tracking where you left artifacts on your desk to a body-controlled DJ system to a way to immersively interact with photos in a temporal way.

Professor: Making as Designing versus "Narrowing Too Quickly"

There was a tension between Marty and Mei, but it was only addressed head on by their respective students, with Emily and other second year leaders serving as intermediaries. It became clear that Marty felt as if prototyping—in virtually any form, digital or physical—represented a weak design process. For him, it was a capitulation; and early failure of picking an idea and holding it too tightly. Mei, by contrast, saw the process of making and building in a more traditional design school way. That, by the very act of constructing, the designer is made to think about their process, interrogating a design through some physical manifestation.

This continues the two discourses on design that the first years experienced: Marty embodies the design process as a way of thinking and apprehending the world, drawing analogies to many design disciplines, but never settling down into HCI; Mei centers her entire approach to design around the emerging issues in the field—some of which she helped to introduce—such as criticality, feminism, and materiality. So while Marty ignores context-specificity, materiality of designed artifacts, and most designs that fall outside of the wireframe-able space, Mei (and David by proxy) embrace the interpretive, experiential qualities—many of which can come only from interaction with an object and construction in the physical world.

A Growing Sense of Purpose

Alongside the activities of making and designing, there was also a parallel thread of immersion in design theory. Over half of the cohort was enrolled in an elective course on design theory, which actively engaged the students in theoretical and philosophical readings, and an introspective journey into their own beliefs about and philosophy of design.

Second Years: Internship Vindication

Many of the students who had completed internships during the summer came back to the program feeling ill-suited to evangelize design approaches. They had realized that, while their training to engage in design activities was intact, they had limited abilities to communicate the importance of this design approach to others, especially in contrast to more scientific approaches to design. On one hand, as Emily told me, she wanted to advocate for design and "prevent the design bubble from bursting" (Interview, 12042013); but others like Adam saw an even more personal connection with theory, saying "it's really impacting everything you are doing" (Interview, 11212013). He shared with me that this course was giving him the concepts to talk about many of the things he felt during his summer internship, but was unable to adequately explain to his coworkers that did not share his predilection towards designerly approaches.

During the process of working through readings and a series of research projects in this design theory course, students were provided terminology and constructs surrounding design activity that began to span this communication divide. Students reported finally having the language to have the conversations they had begun with less designerly co-workers in the previous summer; being able to mount a defense for the things they knew to be true about design in an intuitive sense, but where they could not fully thematize or objectivate those concepts in a conversational way.

Professor: Not Quite There Yet

Even though students had made great strides since Marty first encountered them in their first semester, he felt that the second years still had a lot to learn. In the early weeks of the rapid design course, Marty pointed out weaknesses in their ability to conduct question and review sessions with their real world clients (Figure 39), all in service of making them better designers. The weekly curveballs, negotiated by Marty with the clients (often alumni), were constructed to address specific weaknesses Marty noticed in the students' work; to remind them that while they would be out practicing as designers in the field in less than a year, they were not there quite yet. In fact, Marty seemed to relish finding the "pain points" that would cause them to fail; in his last project of the semester, Marty asked the students to design their own rapid design prompt, as they had experienced almost a dozen times during the semester. As one of the students presented their brief on the final day of class, they said that their project teaches the lesson that "no matter what you do, you're going to get fucked up." Marty laughed and agreed, saying:"that's my teaching philosophy!" (12102013, RDSC).

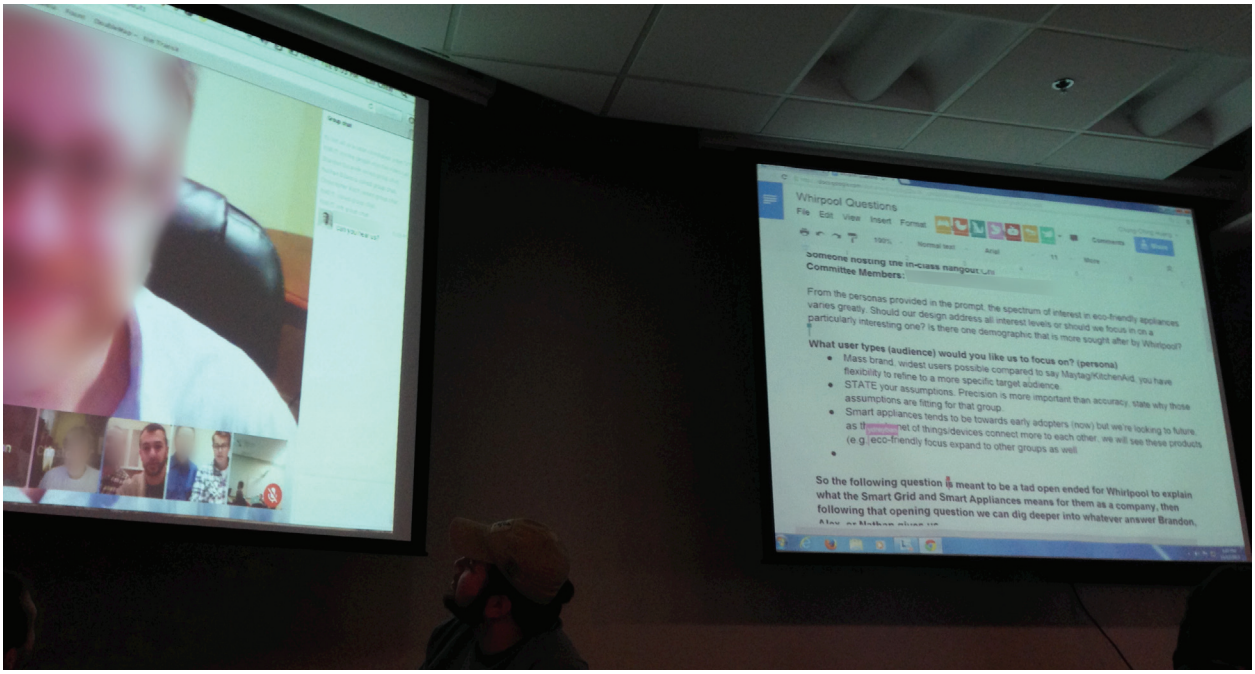


Figure 39. Students interact with the client and take notes in a Google Doc in RDSC.

Second Years: Building a Design Philosophy

This exploration of design theory was not oriented just towards philosophical ends, but had a definite trajectory. ES encouraged the students early on in the semester to begin considering the contents of their *own* design philosophy. This personal design philosophy represented not only the goal of the course as a whole, but also its capstone achievement, in the form of a presentation (Figure 40) and paper. These were intended to be tools to help generate internal reflection about their role in relation to design, and to serve as a framework for communicating these ideas to other designers and future employers.

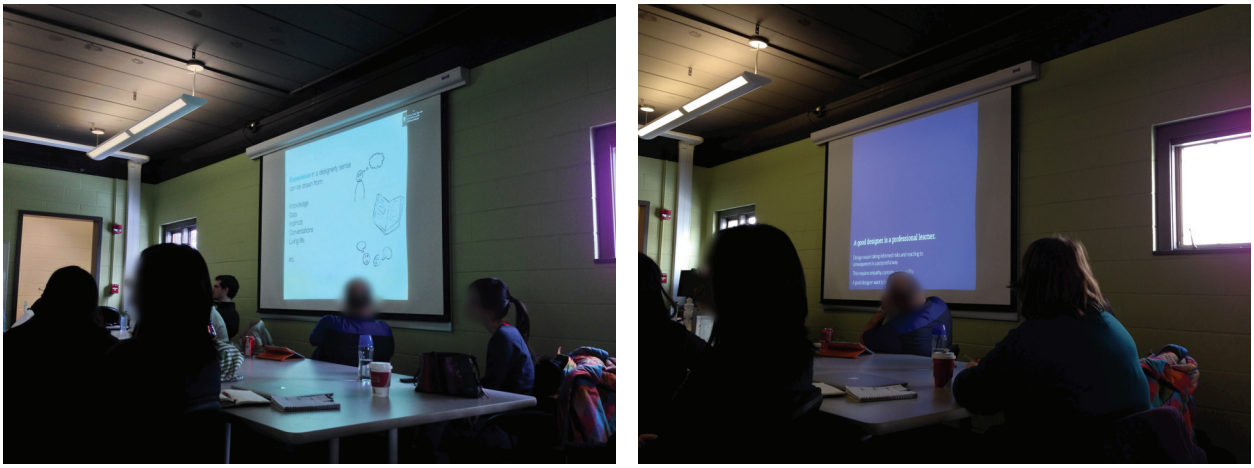


Figure 40. Students present their personal design philosophy in class.

In parallel with this discovery of design philosophy that many students were engaged in, Marty also encouraged reflection into the individual character and infrastructure of his design students. In the rapid design course, students were exposed to stories from the *This I Believe* project at the commencement of each class session, gradually building a sense of what a personal identity and philosophy might include. At the end of the semester, students were invited to create their own *This I Believe* spoken word essay. While this was an optional project, virtually every student in the class submitted one, and these were played back in the final days of class.

These attempts to document one's own design philosophy is an important counter to much of design education in a traditional framing, where an undissected philosophy is often communicated to students—one that is more cookie-cutter than individually constructed.

Professor: Adapting and Questioning

In discussing the projects and readings with ES, the professor teaching design theory, he noted where changes had been made from previous years, where questions asked on projects (often occupying half of the class time) were stimulating the right kinds of discussion, and how by the end, somewhat mysteriously, everything started to come together for the students. His attitude as instructor was that of constant adaptation and questioning of his strategies, with a commitment to making small changes to projects, readings, and discussions to meet the needs he saw his students communicating throughout the semester; for example, at the midpoint of the semester he "had one assignment and then I completely changed it and removed it and made a different one" (Reflection, 10212013). This naturally informed how ES saw the purpose of the class: "I see most of these students as going to be professionals." For PhD students, it's more important to understand the theories; for these students, "it's more important to understand themselves" (Reflection, 11042013).

The course met on Mondays and Wednesdays, but the experience of the course was very different; Monday was more focused on lecture and discussion, while Wednesday was more studio-like, with time for teams to work on their projects and interact in desk crits of their work. ES told me about this construction:

> *[it is] very deliberate; there are so many reasons for that…I want to focus on the big ideas, but the only way to make big ideas make sense, or interesting, or real is to make them be applicable on the very lowest level. So that's why I want assignments that are very hands-on, practical, concrete about real people doing real things in a very diverse and messy way, then have that as a base, and at the other end have all of this stuff that we are reading.*

And they have to make sense of that. Everything you want to merge, you have to split it up. (Reflection, 09232013)

ES adopted possibly the most relaxed posture towards his class of any of the professors I observed—but this was not an attitude of indifference, but rather a realization that the journey was most important, and that success lay in providing flexible opportunities for students to question and alter the pedagogical structures to learn more about themselves as designers.

In both of these efforts to create a space for students to think about their individual and unique role as a designer, a stronger sense of design identity emerged. Many students reported that the two efforts—the personal design philosophy and This I Believe essay—were part of a singular effort: to discover their design "core," and the beliefs that were most important to their future design practice. Here, we can see one of the main intersections in the program—where philosophy and theory merged between two different courses—a rare moment of unintentional alignment.

Disappointment, Marginalization, and Threats

For all of the second years' successes, a number of them were bothered by the quality of interactions with the first years, especially those who were serving as mentors. What seemed most likely to be shyness and introspection on the part of the first years—an apprehension to show off work or engage with more experienced students—was read by many second years as arrogance. An attitude that, at their stage, 'we needed our mentors'; and these first years don't seem to need us as much as we think they should.

Second Years: Expertise, Avoided

Second year students felt as if they were being ignored by the first year students; being marked as not having knowledge or expertise to share. Even though Marty had set out a list of the "Top 10 ways to fail at your project work" early in the semester in IDP, including the statement: *Don't consult with a mentor; they're just students like you. What do they know?* Several students shared their rationale for why this might be taking place, pointing out students they felt were being divisive, actively not "buying into the program" and encouraging others to do likewise. There was also an expressed concern that there was latent sexism and racism that affected who first years *did* go to when they needed help; the female mentors were talked to less than the loud white males, and the Asian mentors were often only utilized by other Asian students.

It is likely that the perpetuation of the stereotype of the "angry American" was in full force here, where the dominant white males were more respected than those that were quiet, thoughtful, and represented other valuably diverse viewpoints. The first year cohort was significantly quieter than the second year cohort was used to, and the mentors seemed to read this as complacence rather than quiet engagement.

First Years: Stressed and Anxious With Nowhere To Go

During the middle portion of the semester, the first year students reported to me that they were exhausted—physically and emotionally. Several students noted that they learned more and were asked to do more in these first months of the program than in large chunks of their undergraduate experience; they were being asked to give up their former identity as a journalist, cognitive scientist, visual designer—all in exchange for a new designerly identity. Corrie told me that "we look out for each other" and that "everyone is trying to help everyone else be their best" (Interview, 12102013). While she agreed that some of the first year students were "so focused on their own projects" that they didn't have time to interact with others, she had worked to draw out

the quieter people to avoid the more common situations where "only certain people would speak up." Cameron described this point in the semester as an "extremely high stress state" due to all of the work they needed to do, and "so little of what we do is in the classroom"; on the other hand, he questioned that maybe "we're all too stubborn?...people are resistant to thinking in Marty or David's way" (Interview, 12112013). This cohort was also more active on the Facebook groups than in the studio space, communicating about a wide range of topics. Cameron explained that these groups not only reinforced participation for those in the studio, but also extended its reach outward to students who did not interact in the studio as much.

I followed up with several of the students that second years had reported were undermining or not "buying in" enough, or worse, were accused of "poisoning" the other students as Marty had warned the mentors early in the semester. None of these students could directly validate these concerns, and while it is likely that their personality or isolated actions were interpreted as poisoning, I did not observe or triangulate any such actions as intentional by these students. It is much more likely that this cohort was more fragile, introspective, and less apt to "put themselves out there" as past cohorts, and this lack of perceived conformity was interpreted as defiance rather than hesitation.

Professor: Driving the Wedge Deeper

This perceived marginalization reported by the second years was revealed in several instances to Marty. While he had used his contacts in the past to reconcile concerns—meeting with students over lunch to fuel his agenda or talk through issues—it doesn't seem that this approach was taken in this case. Marty actively validated the concerns of the second years, expressing his disappointment of the first years in public during his rapid design course, and in private through mentor meetings and reflections.

This deepened an already present schism of distrust between the two cohorts, centered on comparisons between their performance. This also perpetuated the trope of arrogance, with Marty seemingly unsure what to do to encourage more vocal participation from the second years; many of the actions that were taken appeared to support the assumption that more tough love—excluding them from his rapid design class or mentorship opportunities—would make them speak up in the ways he wanted.

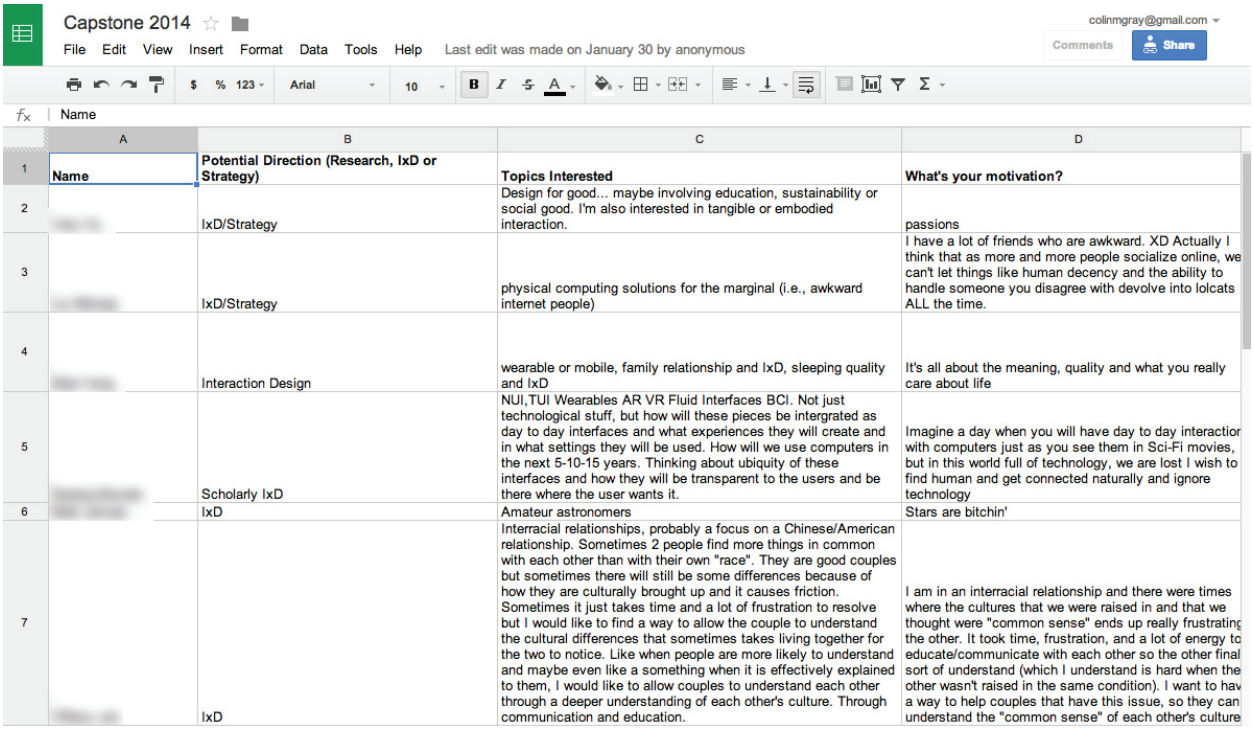
Second Years: Desire and Defeat

In parallel with the felt marginalization of the second years, there also seemed to be an implicit desire on their part for their first years to experience things the way they did, slowly realizing that the first years did not share that goal. The mentors were well aware of the scripted "high points" of the first semester, and they saw their goal as enhancing the showmanship and mystery perpetuated by Marty. They had experienced visceral, highly emotional responses to several of these high points, and wanted their first years to feel those highs just as powerfully as they did. In Adam's words, the second years had gone through their experience "hanging on Marty's every word, but this cohort isn't" (Interview, 11212013). Perhaps the pinnacle of this desire to recreate experience was the shattering of the pot in Marty's class. Several mentors were on the edge of their seats, waiting to relive their moment of anticipation and shock from a year previous, willing the first years to experience it with them; while students did react in shock, their perceived reaction was not as strong as some of the second years wished, with several mentors assuming that they just didn't care, that they were apathetic towards the experience. Adam appeared personally offended when some students refused to pick up a piece of the pot to keep as a memento after he invited them—with him reflecting afterward that he was "pissed off that people didn't collect pieces" (Interview, 11212013).

There was a sense in which the first year students not respecting the shard as token of surrender caused Adam and other mentors to evaluate the tenuous connection with their own pieces of the broken pot from the previous year. In fact, when some first year students said that they were expecting the pot to be smashed, desMatthewing the illusion of surprise the second years wanted, this seemed to wound or otherwise alter the second years' own recollection of their experience.

Capstone Looming

At the end of the semester, the second years were looking forward to the final semester of the program, beginning to apply for jobs and making preparations for the annual student-led career fair early in the spring semester. Discussions of capstone projects had begun early in the semester, with students adding their preliminary topic ideas to a shared Google Spreadsheet for everyone to see, categorized as research, design strategy, or interaction design (Figure 41).



Capstone 2014

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colinmgray@gmail.com

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Name

	A	B	C	D
1	**Name**	**Potential Direction (Research, IxD or Strategy)**	**Topics Interested**	**What's your motivation?**
2	[redacted]	IxD/Strategy	Design for good... maybe involving education, sustainability or social good. I'm also interested in tangible or embodied interaction.	passions
3	[redacted]	IxD/Strategy	physical computing solutions for the marginal (i.e., awkward internet people)	I have a lot of friends who are awkward. XD Actually I think that as more and more people socialize online, we can't let things like human decency and the ability to handle someone you disagree with devolve into lolcats ALL the time.
4	[redacted]	Interaction Design	wearable or mobile, family relationship and IxD, sleeping quality and IxD	It's all about the meaning, quality and what you really care about life
5	[redacted]	Scholarly IxD	NUI,TUI Wearables AR VR Fluid Interfaces BCI. Not just technological stuff, but how will these pieces be intergrated as day to day interfaces and what experiences they will create and in what settings they will be used. How will we use computers in the next 5-10-15 years. Thinking about ubiquity of these interfaces and how they will be transparent to the users and be there where the user wants it.	Imagine a day when you will have day to day interaction with computers just as you see them in Sci-Fi movies, but in this world full of technology, we are lost I wish to find human and get connected naturally and ignore technology
6	[redacted]	IxD	Amateur astronomers	Stars are bitchin'
7	[redacted]	IxD	Interracial relationships, probably a focus on a Chinese/American relationship. Sometimes 2 people find more things in common with each other than with their own "race". They are good couples but sometimes there will still be some differences because of how they are culturally brought up and it causes friction. Sometimes it just takes time and a lot of frustration to resolve but I would like to find a way to allow the couple to understand the cultural differences that sometimes takes living together for the two to notice. Like when people are more likely to understand and maybe even like a something when it is effectively explained to them, I would like to allow couples to understand each other through a deeper understanding of each other's culture. Through communication and education.	I am in an interracial relationship and there were times where the cultures that we were raised in and that we thought were "common sense" ends up really frustrating the other. It took time, frustration, and a lot of energy to educate/communicate with each other so the other final sort of understand (which I understand is hard when the other wasn't raised in the same condition). I want to hav a way to help couples that have this issue, so they can understand the "common sense" of each other's culture

Figure 41. Students share their capstone ideas in a Google Doc.

The second year students seemed to rebel against the expectations Dwight had for their capstone project, actively discussing their displeasure with the structure that was laid out for them. And even in this frustration, there was also a sense in which the capstone was relatively meaningless to them—several students already had jobs, and the reality was that most students would have job offers, with or without their capstone. This directly contradicted Dwight's statements to the first year students earlier that semester, positioning the capstone as the "thing you'll be most proud of when you leave here" (Studio, 09302013).

The semester ended with a party at Marty's house, celebrating the end of the semester. Most of the attendees were first year students, with a number of mentors and faculty present as well. This concluded the school year, with only David's final exam left for students to complete. And the first year students were to continue, as Cameron put it, their "journey inward" to find and express themselves (Interview, 12112013).

Figure 42. Students mingling at Marty's end of the year party.

CHAPTER 6: THE DOWNHILL SLIDE

The narrative now shifts backward in time, from the starting point in chapter five documenting the Fall 2013 semester. This narrative begins in Spring 2013, where I explore how the mentors from chapter five experienced their second semester of their first year, including relationships to their second years and relevant course experiences. During this semester of data collection, no classroom observations or faculty reflections took place, so this narrative is told exclusively from data collected in the studio and through supporting interviews and Facebook conversations. Additionally, a single narrative is presented, reflecting the more unified experience between cohorts in the spring semester.

Starting Classes

First year students were enrolled in a predetermined set of courses (Figure 43), comprised of a design research methods course with Mei on Tuesday mornings, a course on experience design with ES on Tuesday and Thursday, and a course on visual literacy and meaning making through images with Dwight on Wednesday evening. The second year students had only one required six-credit course, which encompassed their capstone experience. This evening studio was led by Dwight, consisting of multiple opportunities for developmental review during the semester, and culminating in a public exhibition of capstone posters at the conclusion of the semester.

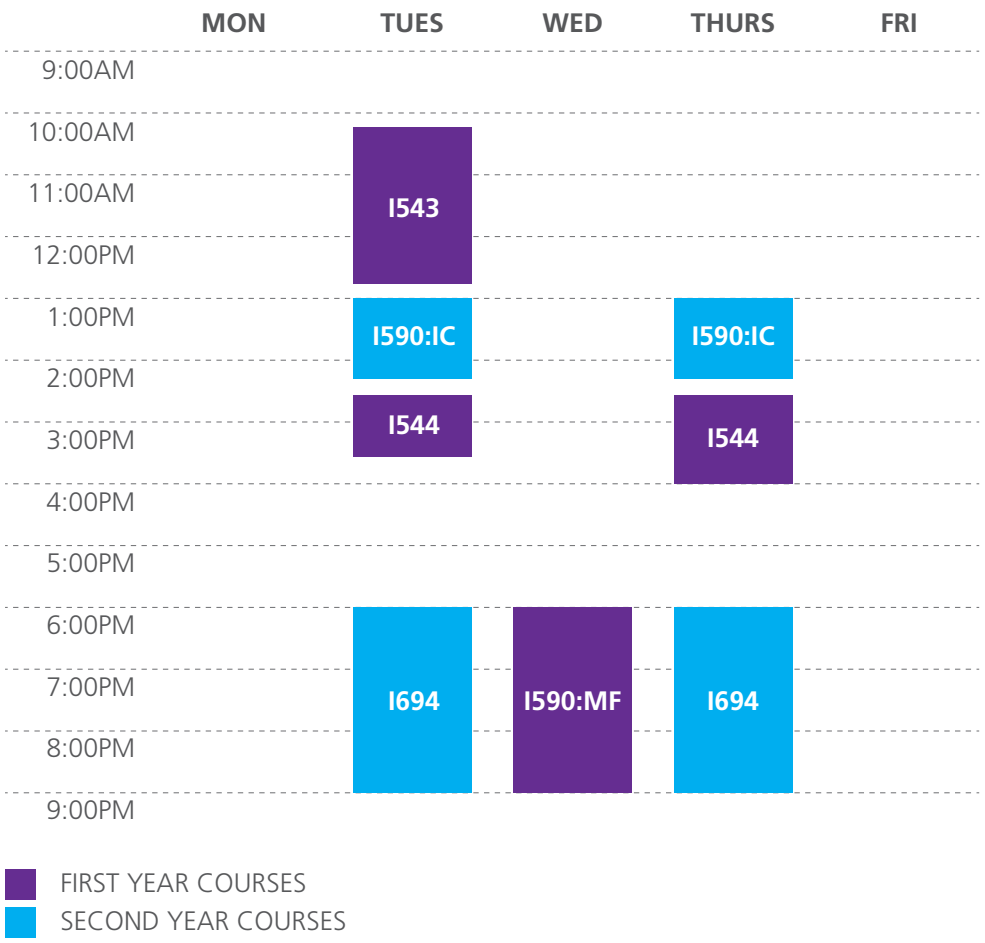


Figure 43. Spring 2013 Course Schedule.

New Semester, New Challenges

As students began their second semester, a new set of courses and professors took the place of Marty's IDP and David's readings course. While the first year students were engaged in three different courses—each touching on different areas of HCI—the second year students were focused on their capstone or thesis—their first large-scale project of the program, completed individually.

First Years: Growing Equality

The first year students moved into a more equal role in the studio, leaving behind the formal mentoring experience of their first semester. The majority of their projects

were still completed in teams (Figure 44), and project meetings dominated the interactions between students in the studio. But with the growing absence of the second year students, the first years dominated the social and designerly interactions in the studio.

Figure 44. First year students planning a project for experience design.

The shift of one semester also changed the way first years perceived their role in the program. In talking to me about who is able to give a valid critique, Emily noted that "Marty beats out of us [in IDP] that professor critique is better"—she felt that IDP was an equalizer among the students, and that everyone has valid opinions; "everyone has a skillset [to offer during critique]…and not all professors are designers" (Interview, 04182013).

First year students also engaged with and shaped the studio space differently during this second semester. Emily thought there was a sense in which "first years are taking over the space" because there is "more of a social dynamic with the first years" as compared to the second years (Interview, 04182013). A PhD student from education, Marcus, took ES's course in experience design, and shared his perspective on the studio coming from a more traditional context of learning. He mentioned that he felt the "boot camp form of training" came through in his process, and that the studio space "embodied the values of the human-centered design process…it supported a certain type of process." In his interactions with other students, the "physicality of the space was foregrounded…it wasn't just our team in the room"; there was a recognition that he was embedded "in a culture of production…[with a] shared sense of purpose and process" (Interview, 07172013). Liz reflected further on the cultural norms of the studio as she experienced them during this semester, with the belief that the studio could be public or private, with the use of headphones as a symbol of a student desiring privacy. She explained that sensitive people don't tend to hang out in the space as much, and some people who have "less tolerance for chaos" functioned better in a classroom environment than in the open-ended studio space (Interview, 041113).

Second Years: Growing Isolation

In the last semester of their program, the second year students related to each other almost completely in terms of their portfolios, employment design challenges, and job interviews. While these students were enrolled in a six-credit capstone course, with the exception of two or three students, no substantial design activity relating to capstone projects occurred in the design studio.

The 2013 cohort had generally been more independent throughout their program. As Megan noted, the first year cohort (the 2014 cohort) was closer than her cohort; during the first semester, both cohorts were fighting for space, but the first years had taken ownership during the second semester as the second years went away to work on their capstones (Figure 45). RM also

told me in an informal conversation: "a lot of second years got turned off last semester by first years *constantly* being up here" (03212013, Studio). Another second year student, an infrequent participant in the studio, mentioned "I don't like to work in the studio…it's loud and crowded…at home it's just me and the dog" (03072013, Studio). He remarked that he only came on campus for capstone on Tuesdays and Thursdays, and worked elsewhere for the remainder of the week.

Figure 45. First year students interacting while a rare second year student works alone.

Although RM regularly worked in the studio, he felt that the first years had "taken over this space," primarily because the second years' schedule was more open and flexible. He was one of the few second year students to regularly work in the studio: "I just like working up here" and liked having people around to help him, but recognized that other second years preferred to work in other locations (Interview, 04242013). The capstone project was also a turning point for many second years, as Megan explained that she was spending much less time on campus while working on her capstone, but is "not doing anything" and feels lost working on a project of this length (Interview, 04122013).

The second year students seemed to distance themselves from the studio as they reached the capstone stage. While the first years were dominant, the lack of a group component to the capstone also appeared to shift the collaborative nature of design characteristic of the other semesters of the program, leading to fewer interactions in the studio among the second years. Additionally, several members of the 2013 cohort had already received jobs, and mentioned they had "checked out" of their capstone.

First and Second Years: Building a Culture of Critique

Adam talked at length about his "rolodex [of skills] in our heads" that he turned to when locating critique on a project; he mentioned that Marty had initially helped him build an understanding of where other students had specialization, and that this understanding "became my speed dial" to socialize and talk through design work (Interview, 05292013). Michael (2013) had a sense of what people in his cohort were good at certain kinds of critique; for example, he said that Megan had a gift for "sensemaking," while another student could "punch a real hole" in a design; yet another student could do a "deeper dive" into a project (Interview, 041313). When RM needs assistance with a project, he looks around for a quick critique, utilizing "whoever is available"; for more specific issues, he looks to specialists in graphic design or specific software tools (Interview, 04242013). In looking for people to critique her work, Megan has located people that specialize in an area she is interested in or needs a perspective from: "who do I need to know about" (Interview, 04122013). Like Michael (2013), Stephen felt that leveraging critique was all about reaching out to other people; to locate certain people for certain kinds of critique; Omar or me for graphic design, Emily or Jordan for copywriting, Troy or Matthew for conceptual work (Interview, 04172013).

After a busy first semester where first and second years were separated through the mentoring infrastructure, these students converged on a shared set of expectations about

how critique should be executed informally in the studio space, including who the participants should be, and what the overall goals of these critiques were.

The physical qualities of the studio space were also valued by the students; Ashleigh appreciated the affordances of the studio in terms of being able to overhear meetings or look at the sketches of other students; since the second years were not present as much, she missed out on seeing their work in a substantial way (Interview, 04262013). Isabella felt that the studio was a "safe area" to interact with other students (Figure 46), and that she was not there primarily "to get stuff done"; she is able to overhear and share with others (Interview, 04102013). She felt as if it's "wrong to be in here [the studio]" if you are in a bad mood—it brings negativity into the space (Interview, 04102013).

Figure 46. Omar offers critique to Isabella on her portfolio (left) and to Stephen on his CHI team's poster design (right).

Stephen saw the program faculty as instilling a "design community" that was collaborative, not centered on individuals; and this came with the expectation of sharing resources and communicating about design (Interview, 04172013). Critique in the studio is "completely informal" and is all about getting "their perspective" on your work—"for you to get their thoughts"

(Interview, 03072013). Nathan felt it was natural to critique in an informal space, because he "had gotten to know them"; that a personal connection was necessary for critique and other designerly interactions to take place (Interview, 03072013). Stephen saw a reciprocal relationship in giving and getting critique—that you "get and give critique to *be* a good designer; that any design discussion was essentially critique, and allowed for ideation in a project (Interview, 04172013). Michael (2013) felt that critique was all about getting to an understanding of how people get to what they make; the process of giving critique is analytical, not evaluative in nature (Interview, 041313).

Professional Preparation

Early in the spring, students planned and hosted an annual recruiting event called HCI/d Connect. This event was intended to be a way to bring employers into contact with the program in a direct way, and provide opportunities for students to interview for internships and full-time positions. Preparations for this event started the previous semester, and students began working on their portfolios in earnest during the holiday break.

First Years: Getting Ready for the Real World

First year students had been encouraged by others in the program to create a professional online presence during the previous semester. The organizers of the Connect event requested a brief bio, résumé, and link to a professional portfolio early in the spring semester, encouraging full participation from all students.

As part of this process, first year students were strongly encouraged to pursue internships during the summer months between their first and second year. Michael (2014) told people in the studio during the month of February that he was struggling starting to write applications for internships: "I'm so worried about doing stuff wrong, I'm not doing it at all" (02072013, Studio). This sentiment was shared by other people in the cohort, and as a way of easing these tensions,

one of the second year students offered to lead a workshop teaching students through mock job interviews in the studio.

The shift towards the professional realm was also evident as first year students interacted with prospective students visiting the studio space. In a discussion with one such prospective student in late March, a number of first year students try to sell the student on their program; Matthew made the claim that "people don't understand design as a discipline" and indicated implications for teaching design relevant to this program. Isabella continued the theme, telling the student: "it's not a competition—we help each other out; JF agreed, saying "it's all about crafting the best ideas—sitting in on other group's meetings" (03282013, Studio). In a later interview, Adam also reflected on the program from a professional perspective, advocating sending resources to other students in the program; he did this because "the program is bigger than I'll ever be…I can't just worry about myself"; he felt that he needed to concern himself with the program and professional community, not just his own journey as a designer (Interview, 05292013). The first year students also recognized their role as the next leaders in the program, and in early April, JF and Troy held a strategy meeting to begin planning the next HCI/d Connect (Figure 47)—almost a year away (04032013, Studio).

Figure 47. JF, Troy, and RM work on the structures needed for the next HCI/d Connect event,.

The first year students tentatively moved towards the professional world of design, while also thinking more critically about the program they were in. This professional world was linked directly with their process of being and becoming leaders, continuing the tradition of this recruiting event, among other efforts, to share and market their program in the larger professional design community.

Second Years: Preparing for Employment

Even as some of the second years were helping to prepare the first years for applying to internships, they were actively discussing the job search with each other. While a few of the second years regularly engaged in work on their capstone in the studio space, the majority of conversation included discussion of jobs, new job postings, interviews students had been on, and employment design challenges. Students shared a substantial amount of information with each other, detailing questions they had been asked; comparing their entries for design challenges that some employers used to narrow down the job pool; and congratulating each other when a job offer was made. Some students had received offers for full-time positions relatively quickly after completing their internship the previous summer, and many students began to receive offers early in the spring semester. In late February, one second year student talked about accepting a job at the same company where he did his internship; he tentatively told a few students around him: "they're paying me more than when I was an intern—what if I'm not better?" (02212013, Studio). Even despite some of this tentativeness regarding entering the job world, Naresh, a PhD student in the department, remarked to several second year students in the studio: "your cohort is getting really good job offers" (04042013, Studio). Samuel told Naresh that his attitude is that "we all survive off of each other" and doesn't believe in hoarding all of your professional connections for only your own use.

It is this developed network of connections, built through events like Connect and other alumni contacts, that results in students getting job offers. While the capstone is perhaps the largest pedagogical element of the program, the students' minds are firmly oriented towards finding a position, and making the necessary connections to ensure that they will receive a job offer.

Working in the Studio

During the beginning of the previous semester, the studio space was new and unfamiliar—students did not yet know how to interact, and in many cases, did not understand what their place was in the studio. But the second semester brought a more familiar set of interactions in the studio in terms of design activity, as well as a more socially-driven decoration of the space. Early in the spring semester, a group of students decorated the studio for the spring festival fair, and many of these decoration remained for several weeks, until students were encouraged by some of the professors to remove them (Figure 48, top). Students also integrated their knowledge of HCI with other holidays like Valentine's Day, creating HCI-themed valentines that were distributed to students in the studio (Figure 48, bottom).

While students had been separated along the lines of cohort during the previous semester, with their separation formalized through the mentoring system, this new semester brought a more unified studio culture. While few second year students were present, those that did use the space on a regular basis contributed to these more cohesive, and often humorous, interactions.

Figure 48. Students decorated the space for Chinese New Year (top) and designed HCI-themed valentines (bottom).

First Years: Mad Skillz, Reborn

The concept of the Mad Skillz Club had existed for a number of years, but had not been very active during the 2014 cohort's first semester. Very few of the second year students were interested in perpetuating this particular student tradition, but several of the first years found value in the concept of sharing skills and tool knowledge with each other. Stephen took the first steps during the spring semester to promote this event, first marketed to the students on the whiteboard and on Facebook, encouraging the students to "come whenever; leave whenever" (Figure 49, left).

As the semester progressed, Stephen, along with the help of Emily and Matthew, began to set up more structured sessions for the club, consistently meeting on Monday evenings from 5:00 to 7:00 PM. Professors took notice of the club's existence, but did not participate in a direct manner. In early March, Marty noticed the advertisement on the whiteboard for a Mad Skillz Club on Adobe InDesign (Figure 49, right). He mentioned the club to Adam, who was present in the studio, remarking: "So, InDesign tutorial today? Who's teaching?" Adam quickly replied, reinforcing the tenet of the club: "there is no teacher…it's only collaboration" (03042013, Studio). Dwight also recognized the fact that the club was meeting again, remarking to some of the first year students while referencing the Mad Skillz Club information drawn on the whiteboard: "I'm really happy you guys are doing that—that's great" (02272013, Studio).

A fuller exploration of the Mad Skillz Club, and its development over time, can be found in the previous chapter, where the ideas generated here evolve further during the Fall 2013 semester. In addition, a fuller exploration of the discussion that occurred in these events can be found in one of the vignettes in chapter seven.

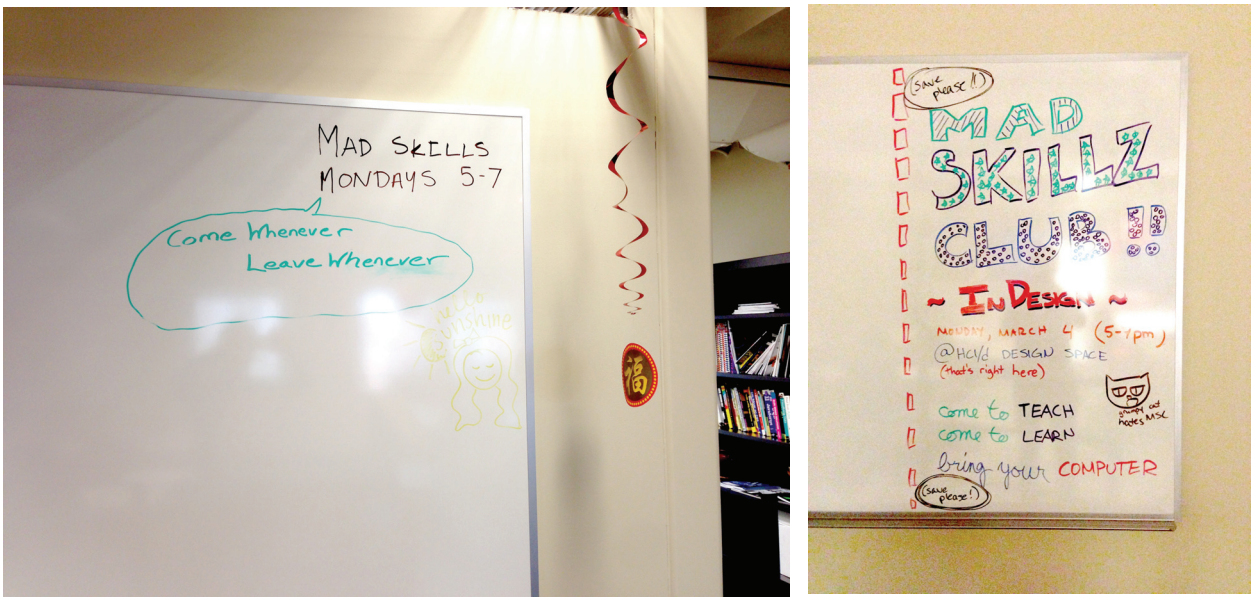


Figure 49. Students market upcoming Mad Skillz Club meetings on a whiteboard in the studio.

First Years: Being "Kicked Out"

In mid-April, I entered the space to find a number of students working in the south area and in the carrels surrounding the main design space. Students informed me that Dwight had taken over the studio space for PhD seminar, seemingly without warning to the Master's students. Adam, clearly frustrated, asked Marty quizzically: "how can we be collaborative without our collaborative space?"; Marty explains that the room they had originally chosen downstairs was double-booked, and they had to use the studio as a last resort (04122013, Studio). Emily shared more detail about being forced out of the space, saying that David had been asked to "kick out" the students working there so that the seminar could begin. As the seminar progressed, Dwight came out to ask students to be quiet, forcing any interactions between students to take place in a loud whisper, making collaboration difficult.

First Years: Marking the Space

During the spring semester, the studio space underwent a number of changes relating to the exhibition of student work and the privacy of faculty offices. In February, Dwight met with a female interior designer in the studio to discuss modifications to the space, holding up a poster

frame and discussing where these frames will be mounted throughout the space. To accommodate more posters, they audibly considered removing one of the whiteboards near the fishbowl. Austin was working in the space at the time, and mentioned to Dwight that he thought "students would revolt if any of the whiteboards are removed." Naresh, another PhD student in the department supported Austin's claim, mentioning that most of the time, all whiteboards are in constant use. Dwight quickly retorted, saying "we can't take new inputs" (02282013, Studio).

That same day, staff members came into the space and installed window tint on the bottom half of all three closed faculty offices, obscuring the view of the office space from the outside (02282013, Studio). This change was made to allow the faculty members more privacy, while still allowing for some sense of whether the office was occupied. Later that semester, however, these staff members returned to place film over the upper half of Mei and David's offices, leaving no visibility into the office space; Dwight's office was left with the top half exposed.

In tandem with the physical changes to the studio space, some students were also concerned about the templates for capstone present in the studio (Figure 50), with one remarking "I don't know why they have to be the same" (02132013, Studio). Liz repeated this sentiment in a more forceful way later in the semester, saying that "everyone hates the posters" (04242013, Studio). In describing the purpose of the template to other students, Dwight, the author of the template, described the capstone poster layout as a way to "keep students from doing harm" and maintaining conformity of student projects for the final exhibition (04182013, Studio).

"I have a personal concern that these posters will take over almost every opportunity for students to mark their own space or post in-progress artifacts. An interior designer is measuring around the west presentation table where the Mad Skillz posters are currently located; the power of the faculty is being asserted over student markings."

(Researcher reflection, 04022013, Studio).

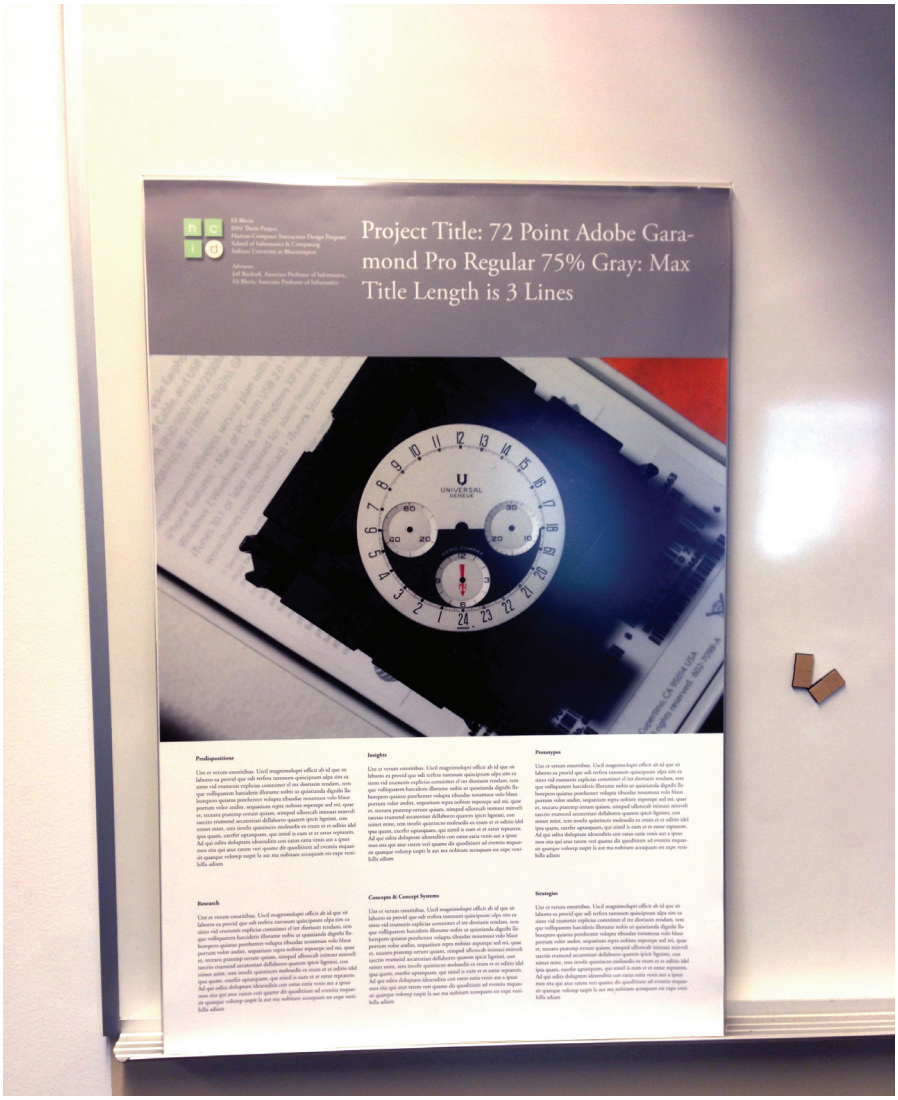


Figure 50. A display version of the capstone poster template.

Professors were also aware of the role of student markings in a design-driven program. In a discussion with David in the studio in February, he pointed out the general lack of markings and artifacts in various stages of development in the studio, contrasting this with design studios he had seen in other disciplines or professional practice; he then told me that it would be helpful to have a personal space for everyone to post their artifacts (02192013, Studio). Later in the semester, a student working on his capstone project had placed small graphics of coins around the studio space as part of their video prototype; David walked through the space, noticing the coins, telling

the first year students around: "there should be actual design on these walls, instead of gold stars" (04182013, Studio).

Students had similar feelings about the need to mark what they were told was their space, with many students frustrated about the ways in which they were able to share artifacts. Adam remarked about the importance of "making the design space our own"—whether it meant hanging cat pictures or things about sports; all of this was the kind of "creativity that a design school needs" (Interview, 05292013). But he also felt that the capstone poster template was an issue; the brackets were "meant for just that poster," and didn't feel like the capstone posters were the kind of work that should be displayed, since "a lot of people chalk up capstone." In place of these poster frames, Adam told me he would much prefer a "tackboard," as was typical in his undergraduate training in industrial design; the tackboard would provide more transience than the semi-permanent capstone posters, and allow students to post work at a variety of stages: "we don't have the ability to show work as it is happening" (Interview, 05292013).

A student who had attended a professional conference early in the semester also shared this sentiment in a more public way. In early February, Valerie and a second year student talked about an email this first year student had sent out to the entire program, including faculty, earlier that day. Valerie agreed with the contents, saying it was "fair…I thought it was good" (02062013, Studio). While the entire email was quite long, one portion dealt directly with the function of the design studio space:

> *My last point I would like to address is the physical space of the studio itself. It is in my (and several of my comrades) opinion that much of the studio is under utilized both in form and function. With the relocation of the PhD students from the west section of the studio there is an opportunity to create something different. What that space should be I'm not entirely sure, but there are close to forty members in the 2014 cohort that would welcome the challenge of creating something both fun and practical. In fact, since the studio has been home to us and will be home for cohorts to come, implementing some sort of legacy system where one cohort designs a part of the studio for the next one could be a way of both giving back and remembrance.*
>
> *There is also the fact that the studio is awfully bland. While I am not advocating the silly posters of cats or inane phrases posted across the walls I do think that we could be*

> *showcasing different things that are important to both the cohorts inhabiting the studio and prospective students visiting the space. One example that comes to mind is wall showcasing previous capstone projects and maybe even alumni bios to accompany them to show what people are doing after graduating the program. Another would be to showcase the prototypes created in Mei's prototyping class.* (Sebastian, 02062013)

Late in the semester, after the capstone show was complete, poster mounting frames were hung throughout the studio space, filled with posters from the 2013 cohort capstone course (Figure 51).

Figure 51. Poster mounting frames installed in the space (left) and filled with selected posters from the capstone show (right).

This issue of marking the space emerged as a substantial issue for many of the students. While Dwight wanted to bring a more design school-like culture into this program, others with a design background felt that the capstone template format was too limiting, and privileged only one kind of work—a kind that wasn't valued highly by many

of the students. Meanwhile, the need for more flexible forms of artifact display advocated by David and students alike remained unfulfilled.

Designing In and Out of the Pedagogy

During the spring semester, students were engaged in design projects for capstone, research methods, visual literacy, and experience design, but several teams accepted to CHI also finalized their design projects throughout the semester, preparing for the CHI conference in late April. These efforts left a mark in the studio space, demonstrating the kinds of work that were being requested in the formal curriculum, and what work students engaged in outside of the program.

First Years: CHI Student Design Competition

The students accepted to the CHI Student Design Competition had started their work in IDP the previous semester. Four teams had submitted projects, and three teams had been accepted to present a poster and present their work at the conference in Paris, France. While the projects had been accepted, the teams had to finalize their paper submission and design a poster for the conference, and the teams worked on these elements throughout the months of February, March, and April.

One of the teams going to CHI held their meetings in the studio, discussing work they still needed to do to form their final revised paper; they had invited Mei to offer critique and suggestions, and she joined them in the studio space near one of the whiteboards late in February (02272013, Studio). They were working on a wearable wristband to motivate student athletes, and Mei remarked that the product is "innovative for this specific period of time" but they needed to consider the trajectory of the work, and how they proposed to create the infrastructure needed (02272013, Studio). Near the end of her discussion, the team was still struggling to identify the method to use to evaluate the user; Mei remarked to them: "you are taking experience design—what is the experience?" (02272013, Studio).

Later on in the semester, two teams hung initial drafts of their posters in the studio (Figure 52), requesting critique through a series of Facebook posts. Through a series of misunderstandings, some of the students and a professor thought these posters were final designs, resulting in a harsh summative critique. Adam told me that his team got "lots of flack" for hanging up the CHI posters for an early critique, but he felt it was worth it because it "broke down that wall of not being able to hang stuff" (Interview, 05292013). Megan, a second year student, thought that the critique on posters was helpful, and that she understood the CHI poster drafts were "hung up specifically for critique"; but personally, she felt that informal critique in a conversational way was more useful than post-it notes with no dialogue behind them (Interview, 04122013). Emily pointed out the issues of misperception in these CHI poster critiques, that the "intentions [of the teams] was misunderstood…the posters were a draft, not final." She felt that Marty gave mixed messages about critique, and the harsh language that was left on the whiteboards next to the posters "really got me"; she and her teammates were looking for generative critique, and eventually were able to get it through one-on-one conversations with Omar, Edwin, and another PhD student (Interview, 04182013).

Stephen's team also requested and received critique on their CHI poster in the space, and he, like Adam, felt that his cohort saw this as a natural way "to leverage the space"; he wasn't worried about others attacking his work, as he believed that honesty was important, even if his natural instinct is to defend his work (Interview, 04172013). He was somewhat disappointed about the "kerfuffle" that resulted from a team hanging their poster on the wall, which Dwight moved to the whiteboard; overall, this came back to his beliefs about the studio space, which "should be focused on design and the design process," and is not always clean and organized.

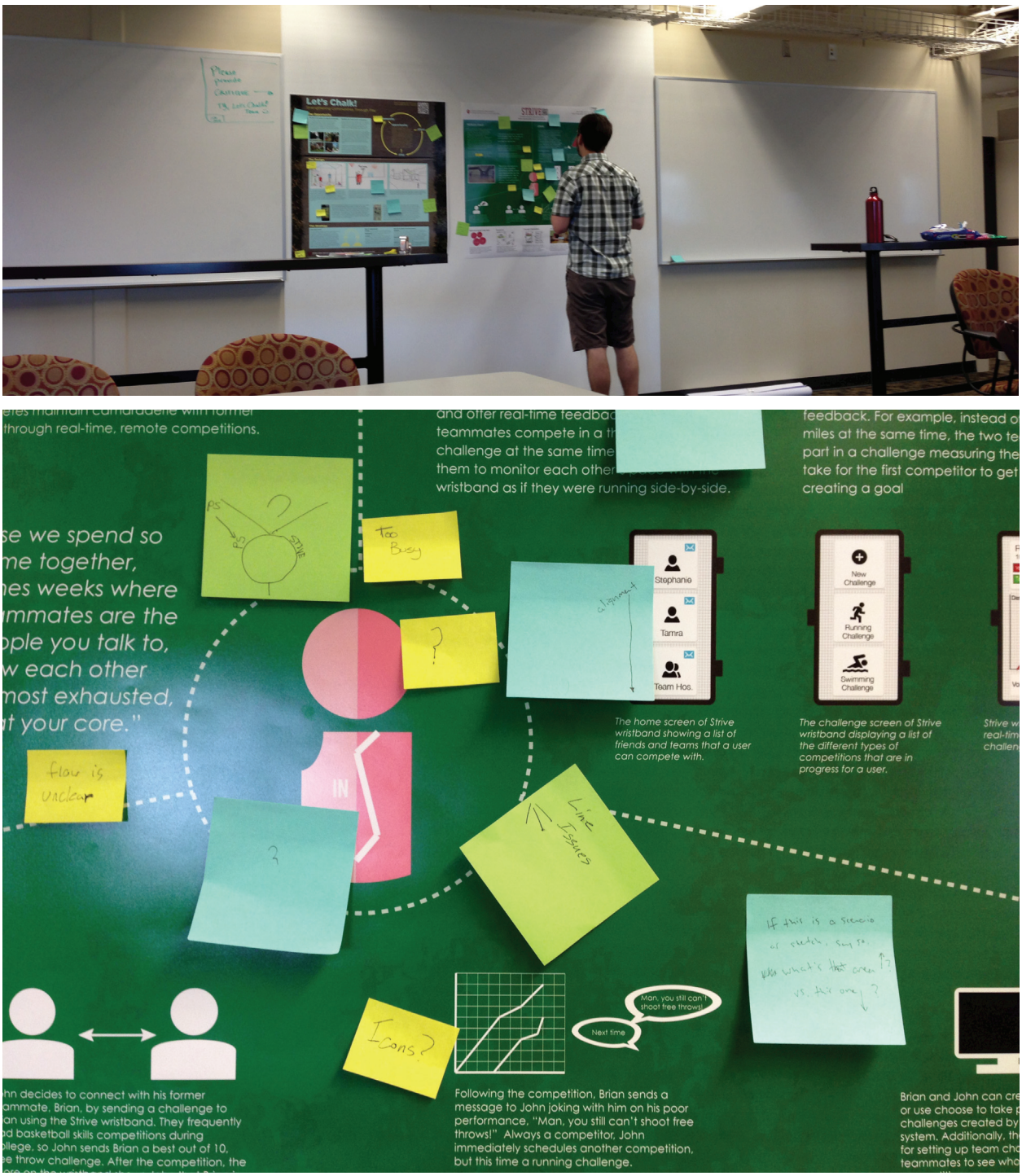


Figure 52. Dennis reviewing comments made on his CHI poster (top) and a detail view of some of the post-it notes left by other students (bottom).

The hanging of these posters for formative critique marked the first time this cohort had explicitly hung artifacts in the studio for consideration by their fellow students. The reaction from the professor and others indicated how artifacts posted in the space were perceived—as final designs—although several of the first year students wanted to break down this particular wall and encourage more sharing. A fuller exploration of this incident is included as a vignette in chapter seven.

First Years: Battling the Curriculum

In parallel with doing work outside of the curriculum for the CHI conference, first year students were also making plans to register for classes the following semester. Some of these students had come to the realization that they would have to pick between taking ES's design theory course and Marty's rapid design course, since they were also required to take a graphic design for non-majors course.

This caused some tension between the students and professors which was formalized at the beginning of April, when Valerie sent out a Facebook event invitation to the first year students, with the title "Right to Choose Your Schedule"; this was targeted at the then-current requirement that students take a graphic design course unless they could get an exemption. JF discussed this issue with a second year student, critical of the motivations behind the Facebook event, which was subsequently cancelled, saying: "I just want the ES experience [by taking design theory]." There was a tension at play, because with the graphic design course required, students would have to choose between the two elective courses unless they could "portfolio out" and be exempt from the graphic design course (04042013, Studio).

Adam discussed the issue of making the course not required in informal discussions with students in the studio, claiming that "moving the class off required makes it go away," referring to the previously required graphic design course. He then discussed the implications of this shift,

saying "we'll have to exploit Mad Skillz for gaining tool skills" (04022013, Studio). Dwight had apparently sent out an email to the first year students, saying that the graphic design course was "pending" and to wait until later in the week for a final verdict. Nathan and Michael discussed their course plans for the next semester, with both intending to take rapid design and design theory; rapid design was mentioned specifically as a good source of "portfolio development" (04032013, Studio).

By the next week, all appeared to be resolved, as Dwight asked two first year students about the revised course selection for the fall semester, with graphic design no longer being required; one student says it is "much better," and Dwight clarified: "I just want to know if you're happy" (04162013, Studio). Adam was asked a similar question—"are the students happy?— by Dwight later in the afternoon, to which Adam replied "I don't know how all of the students feel" (04162013, Studio).

This conflict with the official curriculum caused some tension between professors and students, and resulted in a large number of students taking both elective courses the following semester—up until then, an unprecedented event. While the change in status of the graphic design course showed the power of students in petitioning the program, the initial effort led by Valerie was also rebuffed by students in the program, with a recognition that there was a more diplomatic way to proceed.

First Years: Crafting Experiences

Students developed a wide range of projects during the spring semester, with almost weekly assignments for Mei and Dwight's courses. Mei's course focused on a wide range of research methods, each of which was developed by students individually or in teams, resulting in a wide range of methods displayed in the studio. Dwight's course was focused primarily on digital imagery, and projects were completed almost exclusively as individuals. ES's course on experience

design proceeded at a slower rate, with several larger projects due throughout the semester, culminating in a large project focused on designing a museum experience due at the end of the semester.

The smaller projects in ES's course and method-specific assignments in Mei's course were easily recognized in the studio space. Projects for methods such as affinity diagramming filled the space with post-it notes (Figure 53, left), while team projects focused on designing for experience generally resulted in significant amounts of whiteboarding and discussion (Figure 53, right).

Figure 53. First year students affinity diagramming (left) and concepting for a project (right).

In the month of April, the space began to be taken over with preparations for ES's museum exhibit project, beginning as whiteboard sketches, then proceeding to the shooting of video and depiction of various interactions (Figure 54), and culminating in the editing together of a short video.

Throughout these project interactions, the space was characterized by the sheer amount of group work the students engaged in. The experience of working in the space varied widely from week to week, as different projects demanded different materials, approaches, and types of interaction between group members.

Figure 54. Students shooting video and building physical prototypes in the studio for their experience design project.

Second Years: Capstone

In contrast with the work that the first year students engaged in for their team-based assignments, capstone work was solitary in nature. Aside from one team-based capstone project, all projects were completed by individual students, most who did not regularly work in the studio space. Of those handful of second year students that did use the space, some worked in the studio primarily for the tools that were available, such as whiteboards (Figure 55).

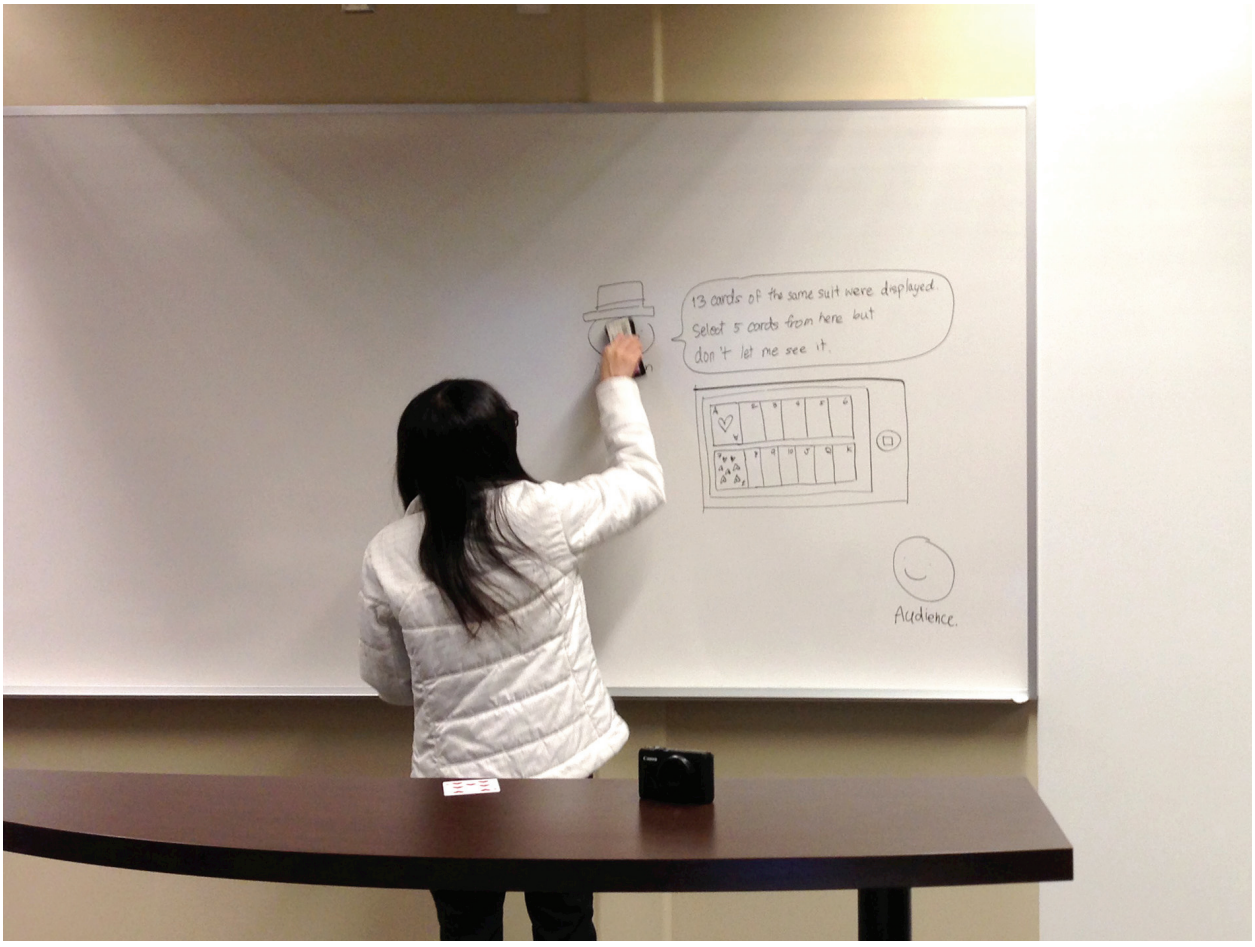


Figure 55. A second year student works on interactive elements of their capstone project.

Other second year students worked in the space for social interaction, and for ready assistance in usability testing, critique, or discussion of other design activities (Figure 56).

Over the course of the semester, less than five students from the 2013 cohort worked in the space with any regularity. While many seemed more comfortable working away from the studio, several students reported issues with the isolation this caused. This also underscores the relationship of the pedagogy, which as a whole requires team-based projects, and the kinds of interactions that become common in the studio.

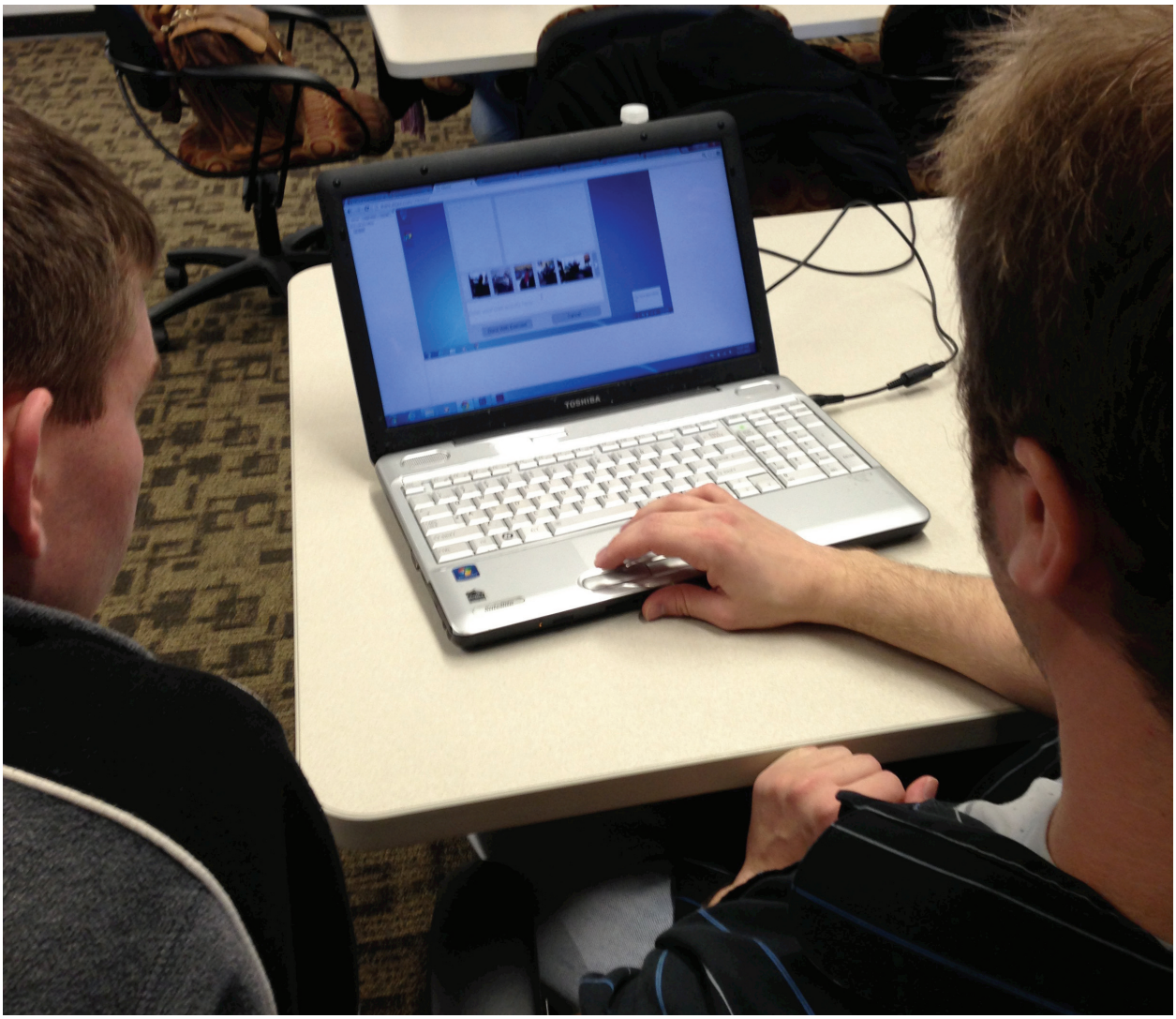


Figure 56. RM walks Nathan through an interactive prototype from his capstone project.

Endings

Near the end of April, the capstone show was held in the studio space. Dwight asked second year students to set up their posters in the space early in the afternoon, hanging the posters using magnets on the whiteboard throughout the space (04222013, Studio). The second year students gradually filled the open spaces in the studio and fishbowl, while other students began to look over the contents of the final posters (Figure 57, right). In the early evening, people began to arrive at the public exhibition, including students, family, and friends; they quickly filled up the main studio space, and talked to individual students about their capstone projects (Figure 57, left). Students used their posters to explain the project focus, with a bound copy of their full project available for additional reading.

Figure 57. Students present their capstone projects during a public exhibition.

Directly prior to the public exhibition, Adam noticed that the Mad Skillz posters that had been hanging next to the west presentation table all semester had been removed; he noted to some of the first years in the studio earlier in the day: "maybe one day we'll get to hang things on the wall permanently" (04222013, Studio). After over an hour of public viewing, Dwight made a

short announcement to the visitors, thanking them for coming to the exhibition. At the conclusion of this announcement, Dwight formally announced to the gathered students and guests that some of these posters would soon be hung semi-permanently in the space, as he revealed the new mounting hardware.

CHAPTER 7: Exploring the Student Experience in Five Vignettes

In this section, I will address five vignettes of interaction between students within the context of the formal pedagogy. These are not meant to be exhaustive, but might be considered critical incidents in that they represent important types of interactions, both recurrent and one time, or typifications that create and sustain the specific design studio culture of this program. Each vignette focuses on a specific interaction framing, with most stemming from studio interactions between students. Half of the interactions also include movement between the physical and virtual spaces, and about half also include some negotiation with professors or other form of institutional power. Each vignette was analyzed using a carefully selected set of meaning reconstructions that demonstrate the cultural impact of these interactions, their role in demonstrating the reproduction of norms and values over time, and their value on the level of system relations and functions. A fuller description of system relations that span across all of these vignettes will be discussed in the next chapter. In the presentation of each vignette, I will provide a description of the setting and actors, its relevance to the curricular experience at large—pointing to placement in the narrative chapters that have preceded, a representation of speech acts and other supporting data, an analysis of this data, and implications for an understanding of the student experience.

Mentored Meeting

Early in the Fall 2013 semester, first and second year students primarily interacted within the context of mentored group meetings. Approximately 15 second year students had volunteered to serve as mentors, and were assigned to groups of first year students that were taking Marty's introductory design course. These group meetings were at the request of the team, but were strongly encouraged by Marty in class, and became one of the criteria for grading later in the semester. When students met in this context with their mentor, there were no predetermined roles

set out by the course or instructor, and the mentors had been asked to guide the students, without leading them directly.

Mentoring Context

This mentorship situation created a power and communication differential between the first year students and the mentor. First year students were generally naïve designers—either with little experience in interaction design, or a non-designer altogether; the second year mentors were generally high achieving, but each brought a unique lived experience, style of communication, and mentoring approach. These mentors were in a liminal space between the academic setting and practice—not quite a professional and not quite a professor. To investigate the roles the first year students and mentor take on more fully, I will introduce a small portion of a mentored meeting early in the semester between Stephen, the second year mentor, and a two-person team for the first design project, Li and Bennett (Figure 58).

Figure 58. Stephen meeting with Bennett and Li, mentoring them on their first design project.

Relevant Speech Acts

During a studio observation on an early Monday afternoon, Stephen joined Li and Bennett at one of the tall presentation tables at the west end of the studio space at around 12:52PM. Li and Bennett had been meeting together since I entered the space around 20 minutes previously, talking relatively quietly—their voices easily drowned out by several other small groups meeting in the studio. I was positioned closer to the east side of the studio, and was unable to make out some of the earlier portion of their meeting, but observed some of the kinds of interactions that structured their meeting. Li and Bennett began by showing some of their work on the first design project, a behavioral design problem centering on the design of a thermostat, sharing sketches and some of their initial rationale. A portion of their conversation, starting as they begin to discuss how to iterate on and test their prototype, is reproduced below with preliminary analysis (Table 11), which I will build upon in the next section.

Table 11: Mentoring Session between Stephen, Li, and Bennett.

	Speech Act (09022013; 13:20:35—13:27:45)	Analysis
1	STEPHEN: You can usability test it.	Stephen provides insight into how to move beyond their initial concept and see how it will work with users.
2	LI: So we don't have a digital machine, we just have a sketch? [inaudible]	Li is unsure how to do usability testing with sketches, even though one of their required texts focuses on this form of testing.
3	STEPHEN: So at least with something like this, you want your tasks to be relative—to be relatively simple things to achieve. So you don't want to give them this whole context and then give them a list of 45 tasks and then stick a piece of paper in front of them.	Stephen moves beyond suggesting to teaching, in a just-in-time sense, how to structure a usability test. This includes a contrast between what should be done and what should not be done.
4	LI: [laughs]	
5	STEPHEN: Yeah, so I mean, there's a—this is hard—this is something I still struggle with and I haven't quite—there's not a form for it, necessarily.	Stephen then pulls back from the instructor role he just took on, replacing it with a more humble, not-yet-practitioner disclaimer. He also seems to be using this role to demonstrate that this is not a clear-cut process, but rather something that requires

	Speech Act (09022013; 13:20:35—13:27:45)	Analysis
		experience.
6	BENNETT: [inaudible] the sketches we can't actually use it. Are we just going to ask them their opinion on it, or how—	Bennett reveals another common misconception on the part of students at this stage—thinking that you are testing people to see if they like it.
7	LI: Which problem will we pitch?	
8	STEPHEN: So, normally you don't want to direct too much, so—ideally, you'll give them the context; like alright, you're going for a run or you're walking outside—so you set the stage for it. And then you'll be like, and this is your thermostat interface. What would you do? That initial reaction could be really helpful, because that's where you start seeing things you never expected. Someone could press this button, and they don't know it's not the right button to push.	Stephen moves back into the instructor role, this time taking a more narrative approach, talking Li and Bennett through what a task might look like for their project. Here, he brings together several of their questions into one "story."
9	LI: So you can tell them which button to pick, and what the next interface that would show up?	Li surfaces another misconception—possibly just an issue of language, but Stephen picks up on this tendency of early designers to "lead" the user too much during a test.
10	STEPHEN: Yeah, I mean I wouldn't tell them—I would let them figure it out, because that's like the—	
11	LI: Go to 8, then go to 7—	Li demonstrates her understanding of the approach Stephen is hinting at, which he will discuss in more depth in [15].
12	STEPHEN: Yeah.	
13	BENNETT: Maybe we could do like a paper version of a traditional [inaudible]	Bennett proposes a higher-fidelity or three-dimensional prototype to test with users.
14	STEPHEN: You could. Although you only have two weeks, and it's Friday. So you don't want to spend too much time on things.	Stephen shoots down this idea, but gently, playing from a more nuanced student role.
	[…]	
15	STEPHEN: It's easiest if you just cook up your tasks and design the prototype around those. Like the first task will be to turn it thermostat on to a comfortable temperature or 72, or whatever it is. And then it would be like—interface, alright, interact with it how—you just change the screen. That's actually how usability tests—don't pay attention to the man behind the curtain. My hands are just the computer's processor. [laughs] So that's one approach. It's very easily done with paper sketches. Obviously, it's not perfect, but you can get an idea of where—	Stephen provides an even more in depth explanation of how they might execute the test using sketches, switching them out as prototype states are needed by the user. He again employs a more narrative approach than just telling them what to do, providing an alternative for a more in-depth physical prototype, as proposed by Bennett.

Role Analysis

Even in this short segment of a larger mentored meeting, multiple approaches or ways of communicating to the first year students about design issues are foregrounded. Li and Bennett both exhibit relatively common barriers that early designers face, corresponding to development of designerly behaviors in HCI (Siegel & Stolterman, 2008) and my own experience as a design students and mentor for this course. The typification of a mentored meeting is still new to the first year students at this stage, and so there is often a natural enculturation into the relevant norms; first year students are seeking to have questions answered in a direct way, and mentors are often more evasive, attempting to get students to think about why they are asking the questions they do, often using a more Socratic style. Stephen takes on a more direct approach here, but still demonstrates nuance in his responses to Li and Bennett.

Even as the naïve designer role, taken on by Li and Bennett, appear relatively static, Stephen takes on multiple roles in this segment. He moves from dispassionate outsider in [1] to an instructor in [3], [8], and [15] to a more relatable advanced student in [5] and [14] (to some extent). These three roles represent interesting combinations of traditional student, practitioner, and instructor roles, which I will explore in more detail below. These roles are evident in the conversation above, but the construction and depiction of these roles are also based on numerous interactions between Stephen and first year students in the studio space.

Dispassionate Outsider

This role is the most stereotypically the mentoring style that Marty sets out in his orientation and subsequent meetings with the mentors. A balance struck between guiding and leading; listening intently to what is going on, and then asking probing questions to make students think; not giving in to students begging for answers, focusing on getting them to ask good questions.

Quasi-Instructor

This role is related to the previous one, but bleeds over into more formal instructing of the design teams. Some mentors rarely took on this role, preferring to just ask Socratically-driven questions until the team either became frustrated and stopped engaging with the mentor, or some learning gains were achieved. Many mentors, like Stephen in this example, lapsed from this dispassionate outsider role into the quasi-instructor role, upon realizing that students needed some just-in-time instruction on how to perform a discrete task. In this case, rather than pointing the students to readings or other resources that were available to them, he chose to teach them in a more direct way, often providing the instruction in a targeted, contextually-driven way.

Still a Student, Not Yet a Practitioner (Approachable Yet Expert Student)

This role might be described as a more humanized version of the quasi-instructor, where the mentor showed vulnerability, connecting the content knowledge of how to perform a task with a certain humility about how difficult that performance was, even for the advanced designer/mentor. This is a role that would be difficult for a professor to take on, but was more naturally adopted by even the most expert students who were serving as mentors. I connect this humility with the realities of professional practice, as experienced by these mentors in their internships and other experiences, as they meet the realities of the pedagogical experience these first-year students are engaged in. Even though this role appeared relatively infrequently, it was used to humanize the experience, providing a truer peer mentoring arrangement, lessening the power between participants with a shift towards designerly identity, away from academic "correctness."

Summary and Implications

In this short vignette and description of roles, the diversity and complexity of the mentoring role can be explored to a limited degree. The mentoring process was widely acknowledged to affect the design learning of the second years as much as it did the developing first year students,

and I can start to see such a shift, even in this early mentored meeting. A fuller realization of this conversation about usability testing—along with the hesitation shown by Stephen about the correct ways to engage in this method of testing—is revealed to a deeper degree later in the semester when Stephen, Matthew, and other second year students led a Mad Skillz Club meeting around this topic.

It is less clear how these differing roles affect the first year students; it appears that the mentors that played exclusively in the dispassionate outsider role found themselves ignored or rebuffed by their team. Some frustrated first year students shared this experience in the first month of the semester in a class session with Marty, explaining that they didn't know what questions to ask, and when they did ask questions, the mentors just responded with more cryptic questions; Marty responded that they should just learn to ask better questions, with little explanation how to achieve this. This frustration was compounded when students also lacked the skills to execute some of the basic tasks required of them, such as usability testing. Corrie explained to another student in the studio that she was frustrated with Marty and the course, and that she felt as if they were being asked questions "ahead of us" without being told what to do: "I feel like it should be a big relief to have this [project] done, but it's not" (09082013).

Perhaps some of the most personable, power-free interactions I observed were ones where the more humanized, humble role of a designer aware of her limitations, yet also aware of value they could add to someone else's experience arose. Some of the value of this approach varied by the composition of the teams, with several of the international students more explicitly asking for direct instruction on how to proceed; but this was not exclusively an international phenomenon—many students of all backgrounds struggled early on with a shift from a prescriptive, scientific approach to enacting design methods (as with Li and Bennett, above) to a designerly approach characterized by nuanced professional judgments. More research and analysis is needed to discover what impact this humanized role might have on designerly development, but these early results

indicate that personality and communication style is a significant indicator of success in these mentoring relationships.

Mad Skillz Club

Starting in the Spring of 2013, Stephen and some other members of the 2014 cohort began to promote informal learning among students through the organization known as *Mad Skillz Club.* This organization was created by students over four years previous, and had gone through several different iterations of structure, leadership, and purpose through the various cohorts. Across all of the iterations that I was aware of as a student and researcher, the goal was to provide a democratized entity that allowed for informal education and learning among students. In particular, the club was seen as a way for students to get specialized tool knowledge that they felt would be needed in professional practice, but was not explicitly provided in the formal curriculum. Perhaps most importantly, this learning was entirely student-initiated and student-led, with the contents of the meetings, regularity of meeting time, and leadership at the whim of the current cohorts.

Overview of Meetings

Starting in the Spring 2013 semester, Stephen relaunched Mad Skillz Club, with a goal to provide an egalitarian workspace for swap ideas, critique each others' work, and learn or share tool or discipline-specific knowledge with each other. In late Fall 2012, several students from the 2014 cohort had met to strategically plan events for the club, but these efforts ultimately died out, and no sustained meeting times came about. In the Spring semester, Stephen decided to launch the effort on his own in a more pragmatic way, without planning weeks of events in advance; this held true to his assumptions, that "people want to know tool skills" and need a "collaborative work time" in the studio to share that knowledge (Interview, 04172013). He did not expect "100% participation," but felt that all members of the program had a "social contract to share [with each

other]"; this weekly block of time allowed a space for that sharing to take place, like Stephen's experience in a type shop during his undergraduate program in fine arts.

During the entirety of the Spring 2013 semester, Stephen was in the studio from 5-7pm on the chosen day, whether anyone else joined him or not. The sessions ranged from highly prepared discussions (Figure 59) on photography (led by another first year student) or typography (led by a PhD student) to a one-on-one discussion with another first year student about how to use advanced tools in Adobe Photoshop (Figure 60). These events were marketed on Facebook using the current years groups to attract student participation (Figure 61).

Figure 59. Group sessions on photography and typography led by students.

Figure 60. Stephen teaching Isabella to use tools in Adobe Photoshop.

Figure 61. Spring 2013 Mad Skillz Announcements posted in the current years Facebook group.

These events also resulted in artifacts that had a less fleeting presence in the space, including portions of one of the whiteboards in the studio promoting the topic for the next week (Figure 62, left) and letter-sized printouts of the project or tool the club worked on in previous weeks (Figure 62, right). These printouts, in particular, demonstrate the continuity among projects, all executed with a dinosaur theme and marked with the name of the club. These printouts were hung on the wall directly next to the presentation table where these main events took place, marking the space in some sense.

Figure 62. Marketing for the Mad Skillz Club on the studio whiteboard (left); artifacts created during more formal sessions hung on the studio wall (right);

During the Fall 2013 semester, Stephen wanted to continue organizing the Mad Skillz Club events, but planning did not get fully underway until early October, when he created a new Facebook group to organize event planning and to encourage participation from other students (Figure 63). This semester, the events were planned and disseminated exclusively through the Facebook group, with no lasting imprint of the event time or materials posted in the studio. The size of the gatherings was similar to events the previous semester (Figure 22), but they were planned on a more ad hoc basis, with no continuity week to week. Sonya, a first year student, noted after attending a session on video production that it was too lecture-based, and she wasn't given a space to do things on her own; overall, she felt that working on a project herself would be less contrived and a more authentic way to learn (Interview, 11202013).

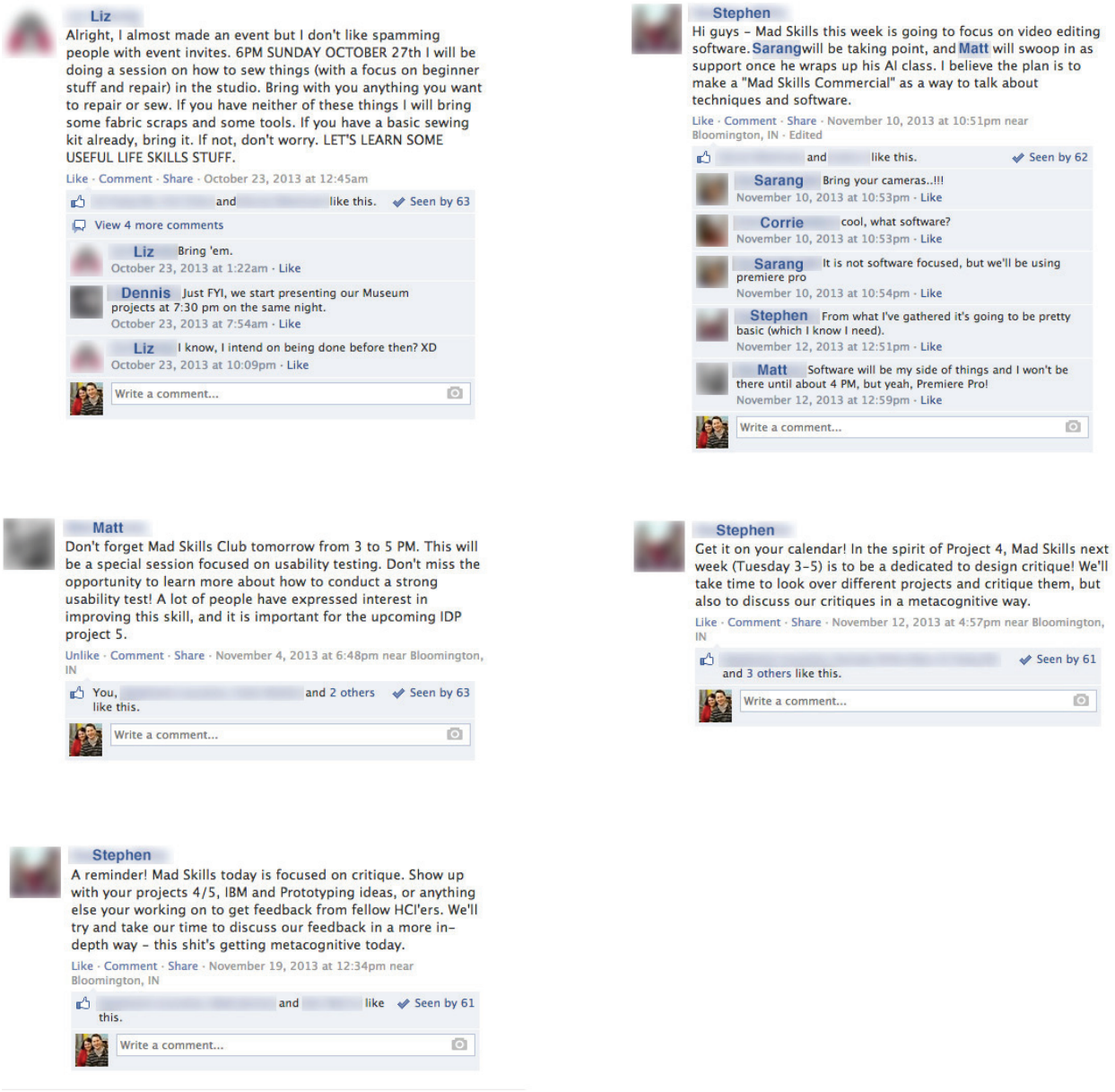


Figure 63. A sample of Mad Skillz announcements posted in the relevant Facebook group during the Fall 2013 semester.

Relevant Speech Acts

Based on these interactions between students in an informal setting, I have selected several speech acts from two different Fall 2013 meetings to explore further. Each of these meetings took place in November, with one meeting focused on usability and the other focusing on critique.

These topics were chosen by Matthew and Stephen, and while they led the conversation in each meeting, any participant was free to join the meeting and provide their own understanding of these topics.

Usability (11052013, Studio)

To prepare for this meeting, Matthew has brought a number of classic texts from Krug, Nielsen, and the Hanington (Figure 64). Matthew and other mentors recognize that the first year students are having problems conducting usability testing in their projects for IDP, and this venue serves as a way for them to teach the students in a non-classroom setting. After Matthew provides a brief introduction, Bennett, a first year student, claims that "usability is a bare minimum," echoing a similar statement that Matthew had made in IDP earlier that semester. Matthew then expands on this idea, saying that this statement came from his boss at an internship the previous summer, not from the program. Matthew also claims that usability testing "will not tell you whether your design is good…design is completed in use."

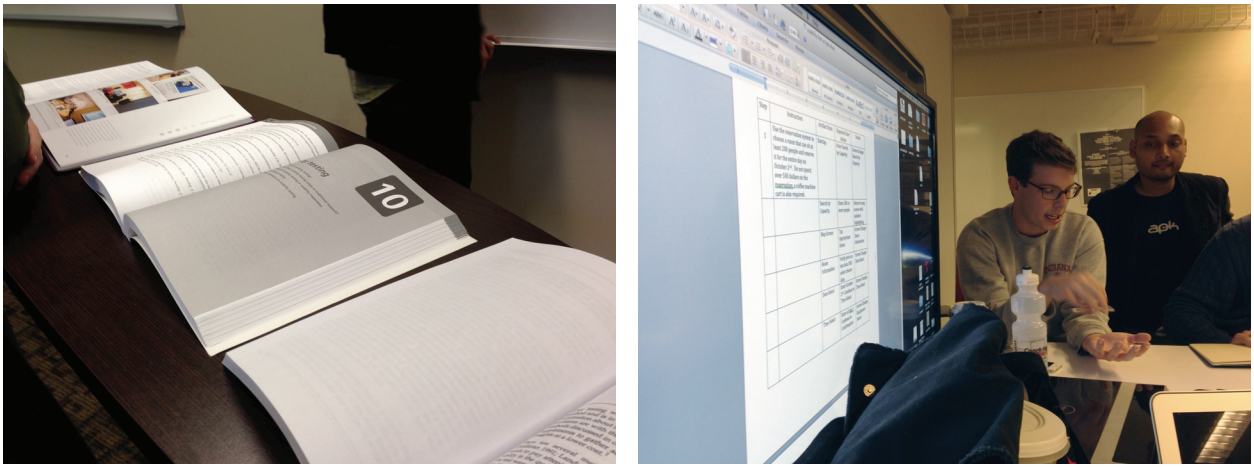


Figure 64. Books referencing usability that Matthew has brought to the meeting (left), and Stephen explaining a table format he uses to structure usability testing tasks (right).

Critique (11192013, Studio)

Like the usability testing meeting, this topic was also chosen by a subset of the mentors due to a perceived lack of "critique culture" among the first year students. Stephen starts off the meeting by saying that "critique is important in our field," establishing the professional rationale for building this skill. Keisha agrees, but says that she is "frustrated with asking questions for the sake of asking questions." Zan described "critique is getting a new set of eyes" to look at a project, while Stephen expanded on this, claiming that the purpose of "critique is not just about whether it's a valid design."

To further this discussion of critique, Lulu offers up her team's project from IDP for critique from the group that has assembled (Figure 65, left). Several people in the group discuss the project (Figure 65, right), which leads to a larger discussion of types of critique by Matthew and Stephen. Stephen remarks that "critique takes different forms—there are different types of critique for different things." Matthew mentions "procedural" critique as one such form, also advocating for his "critique book" where he places all critiques on all projects, not just his own; if you do this, "the links will begin to form."

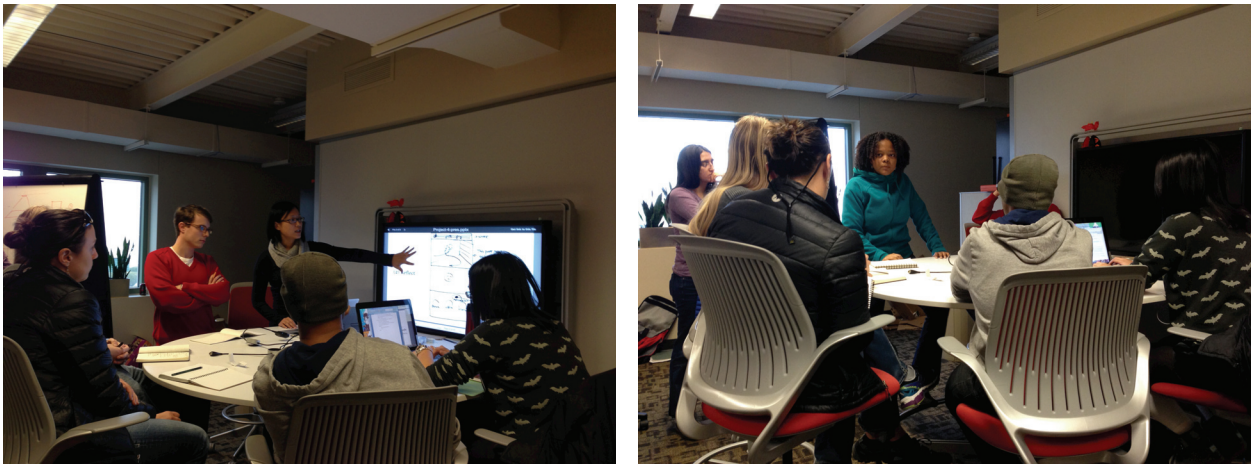


Figure 65. Lulu, a first year student, presenting her project to get critique (left); and another first year student discussing the elements of critique.

After some discussion about these potential types of critique and their varying uses, Stephen reflects on the conversation they have had with the group, saying "this represents what critique is in its best form—a dialogue." Matthew agrees, advocating for critique as a shared conversation, and that "this critique is more common in a real life setting" as compared to the summative critique that is found in a classroom setting. A good critique should answer the question "how should we go forward" with a given design.

Meaning Reconstruction

To talk through these conversations in the Mad Skillz Club meetings represented above in more detail, I have chosen several key phrases used by Stephen and Matthew in explaining the purpose of usability testing and critique. Each speech act is built out using meaning field reconstruction based on the purpose of the act in the overall conversation, demonstrating how each of these second year students thought about these elements of designing through their experience as students and in professional internships. It is important to note that each of these phrases was directed, in my analysis, towards two different roles: that of the student and the student as professional or proto-professional. This split audience or split field phenomenon demonstrates how students in these meetings functioned—not merely as an extension of the formal curriculum, but actively playing out a role similar to the way they would act in a professional context.

Original speech act: *"usability is a bare minimum"*

"Designs should be more than merely usable."
(AND/OR)
"There are characteristics of the design that matter more than usability."
(AND/OR)
"Usability can only tell you certain things about a design."
(OR/AND)
"Usability is not very important."
(AND/OR)
"Designs can be evaluated through several lenses."
(AND/OR)
"Usability is just one lens."
(OR/AND)

"We should be talking more about the other lenses."

(AND/OR – split audience phenomenon)

TO STUDENTS AS PROFESSIONALS	TO STUDENTS
"As a professional, you shouldn't just care about usability." (OR/AND) "This program teaches you to do more than just making something usable." (OR/AND) "Aspire for something greater than usability in your work." (OR/AND) "My internship taught me that we need to care about more than just usability."	"You still have a lot more to learn about evaluating a design" (AND/OR) "Usability is just the first step." (AND/OR) "You need to learn this basic concept." (OR/AND) "You should expand your horizons beyond usability testing."

Original speech act: *"[usability testing] will not tell you whether your design is good…design is completed in use."*

"Designs can only be judged when they are being used."
(AND/OR)
"Evaluation of a design should take place 'in use.'"
(AND/OR)
"Users decide how to use a design, not the designer."
(OR/AND)
"A design is only good if it is usable."

(AND/OR – split audience phenomenon)

TO STUDENTS AS PROFESSIONALS	TO STUDENTS
"Professional designers should make sure their designs are good." (AND/OR) "You have to see how users interact with your designs."	"Evaluation in the classroom isn't enough to determine whether a design is good or not." (AND/OR) "Usability testing is a requirement for your projects, but you have to learn more ways to evaluate your design."

Original speech act: *"critique is not just about whether it's a valid design…critique is in its best form—a dialogue"*

"Critique is all about communication."
(AND/OR)
"Designers talk about designs through critique."

(AND/OR)
"Designers discuss more than validity in evaluating a design."
(OR/AND)
"Critique is an ongoing conversation."
(OR/AND)
"Designers use critique to figure out what to do next."
(AND/OR)
"Critique doesn't tell you what to do."
(OR/AND)
"Critique is not just an evaluation of a design."

(AND/OR – split audience phenomenon)

TO STUDENTS AS PROFESSIONALS	TO STUDENTS
"Critique is how you talk as a designer" (AND/OR) "Critique should be a regular occurrence between designers." (OR/AND) "Designers talk about more than validity."	"There is more to critique than just evaluation" (AND/OR) "Professional critique does not look as one-sided as classroom critique." (AND/OR) "Critique doesn't just happen in the classroom."

Summary and Implications

Based on these conversations in a subset of the Mad Skill Club meetings and a more thorough reconstruction of the meaning fields behind some pivotal speech acts, I wish to demonstrate the way that Stephen and Matthew talked about these key elements of being a designer. While several of the initial clusters of these meaning fields are more teleological in origin—what will this method or technique help you to do—the split audience or split field phenomenon in each brings out a more active comparison between the identity of student and proto-professional. In each instance, there is simultaneously a refutation or contextualization of what the first year students are doing in their coursework, and a recontextualization of how this knowledge will serve them as professional designers.

In the two meaning fields addressing usability testing, this method of evaluation is set up as a baseline understanding of whether a design works, not a way of evaluating the inherent goodness or quality of a design. For the first year students, this is the only method of evaluation

they have been taught; they will have to wait until the following semester to learn a more rigorous, human-centered set of methods to interrogate a design and the use of a design. But even given this limited context on the part of the first year students, treating usability testing as a baseline pushes their understanding of what it means to be a designer to a more professional space—moving beyond what will be covered in the formal curriculum. Matthew mentions that this understanding of usability testing—as a baseline metric, not as the inherent goal of designing—came from his internship, not from the formal pedagogy; so when this kind of language is foregrounded by Marty in IDP and then informally in this setting, its purpose bends towards professional identity.

Stephen positions critique in a very interesting way in these combined speech acts, as compared to how critique is encountered as a method of evaluation in the classroom. While some students have engaged in critique amongst their peers, and even in this Mad Skillz Meeting, Stephen is encouraging cross-team and cross-cohort critique, this method of critique is not one that is socialized in the formal pedagogy. In IDP, critique is almost completely summative, and occurs only when the project is complete and handed in for grading. In this traditional curricular context, the critique Stephen offers—as dialogue, not as evaluation—is quite different from what the students may have experienced. In my reconstruction of the split audience or split field phenomenon, I posit that first year students are being implicitly told to move on from their understanding of critique as only occurring in a classroom or academic setting, to understanding critique from the perspective of professional designers (or students who act like professional designers), who engage in critique as communication on a regular basis.

Designerly Talk Between Students

Communication between students occurred relatively organically in the studio, particularly after the cohort bonded through events such as the weekend lake trip, and became more familiar with each other through group projects. Within this communication, a portion takes on the

normative characteristics of professional or proto-professional roles, where participants shed some of their academic or student identity to engage in talk about design.

Culture of Critique in the Studio

Early in the Fall 2013 semester, first year students were reticent to hang out in the studio or engage in extended communication about their design activities. Most students entering the program had not encountered a studio space in their previous education, tending to work at home or in other locations. Anusha mentioned that initially, she " was never really open to critique—I couldn't sketch here [in the studio]"; but Sanjiv confronted her, saying she needed to be in the studio. Brad also initially stayed away from the studio, choosing to hang out with friends from his undergraduate program, saying that he "didn't like anyone" and was sort of "waiting for people to come to me" (Brad, Interview, 12132013). Even students that were more familiar with the studio space were unsure of how they wanted to use this studio. Sonya, who had an undergraduate background in architecture, had spent her entire educational experience in a studio. She vowed to spend less time in this studio, because "it's not my favorite space" and didn't have enough natural light compared to the studios she was used to (Sonya, Interview, 11202013).

Partially due to the lack of interaction in the studio space, little critique took place between these students either. As Corrie explained, first year students are "so focused on their own projects" that they don't really make time to critique each others' work. She tried to critique student work, and Marty's efforts to promote cross-team critique for one project helped to open the first year students' eyes to the potential value. Corrie mentioned that she has personally tried to draw out quiet people, since "only certain people would speak up" in critique settings. Interestingly, she felt there was somewhat of a mixed message since "we weren't allowed to [critique in class] in earlier projects," and she attributed the stunted growth of critique in the studio space to this fact, thinking aloud: "I won't be respected, I won't be heard, because I can't do it in class" (Corrie Interview, 12102013). Sonya was more critical of the critique process with peers,

explaining to me that she had a "lack of trust of my classmates" to give crits, and thought that it was necessary to be a professional designer in order to give a good crit, and none of the students in the studio "is really a senior designer" (Sonya, Interview, 11202013).

By the spring semester, however, students seemed to be more able to talk in critical ways about their design work, and had become comfortable enough with their cohort to interact more regularly in this way. This vignette focuses on this more developed critique culture in the Spring 2013 semester, describing an interaction between two students who were then first years. A more expansive look at this studio environment and the instigating interactions that allow designerly talk to emerge between students (Table 12) was completed based off of audio recording descriptions of this semester of data, and is documented in Gray (2013b). While further discussion of how these instigating interactions were identified will not be identified in this study, the types are used to some degree in the analysis of speech acts later in this vignette.

Table 12: Instigating Interactions that Allow for Designerly Talk To Emerge (adapted from Gray, 2013b)

Instigating Interaction	Example Interactions
overheard/seen	Design talk or work is overseen or overheard while working separately
smalltalk/social talk	Casual greetings; "what are you up to?"; "how was your weekend?"; friendly talk
showing off	Displaying finished or in-progress work to others without provocation
planned/scheduled	Request to discuss at some point in the future; planned meeting
request for advice	Explicit request for guidance, opinion, or interpretation

Designerly Talk and Critique

Comprehensive reporting of the first eight weeks of participant observations is not possible at this early date, and additional analysis will be necessary to come to more substantial conclusions.

In the interim, a close reading of all field notes collected thus far frames a highly preliminary taxonomy of studio interactions, drawing on the model of critique settings developed by Oh, et al. (2012). Because none of the critique conditions in this model (see Figure 2) directly presuppose the presence of an instructor, the three perspectives should still have some analytic value in interactions that occur in non-classroom spaces. Each perspective—informality to formality, private to public, and number of participants—will be addressed separately within the context of the studio environment, concluding with a set of preliminary interaction types based on collected data.

Formality in the Studio

Since all interactions captured in the first semester of this study take place in the informal context of the design studio, they are distinct from formal interactions in a classroom context. But within the studio environment, there are degrees of formality or informality, often associated with the spontaneous or planned nature of an interaction. Project meetings between group members for a class project may be relatively formal, in that it is planned and consented to by all group members, with social protocols of acceptability for missing the meeting or leaving it abruptly. Informal interactions would then be defined by their spontaneity, arising opportunistically between members of the space based on physical collocation and/or mutual interest. While increasing formality may indicate an increase in structure within traditional classroom interactions (Oh et al., 2012), the structure of interactions is not contingent on formality in the studio space. An informal interaction may take on formal components if necessary (e.g., an impromptu interview for a design project), while formal interactions may be left unstructured to encourage collaboration (e.g., weekly Mad Skillz Club meetings to share tool or specialty knowledge).

Privacy in the Studio

Most studio interactions take on a public nature, due to the shared nature of the space, and the lack of reservable spaces, with the exception of the "fishbowl" meeting room. The expectation of privacy seemed to be relatively low in the shared main design space, while

surrounding spaces may have afforded additional privacy due to their more isolated location. This chance of overhearing other group interactions may be seen as similar to the utility of desk crits, with other students able to overhear interactions and interject if they desire, regardless of the perceived public or private nature of the overheard interaction. Some students appeared to use alternate meeting locations to afford more privacy to their interactions, using the fishbowl, the southeast couch area, or meeting rooms in other parts of the building. Alternate meeting locations may also have been selected based on the availability of technology (e.g., whiteboard, projector) or to distance the group from noise during period of time when the studio was busy. As with formality, an increase in the public nature of an interaction did not indicate more rigor, as it would in a design classroom (Oh, et al., 2012). A public interaction may be unplanned and spontaneous (e.g., discussing a TV show of mutual interest), while private interactions may be highly planned and executed with precision (e.g., data analysis for a class project).

Number of Participants

As with the previous two perspectives on critique settings, the number of students does not limit the formality or public nature of interactions in a direct sense, although an increase in the number of students may indicate a more public event with prior intent. While interactions between small numbers of participants occur with significant frequency (e.g., greetings and smalltalk between students, group meetings with 3-5 participants), larger interactions between 6 or more participants only occurs under limited conditions. These conditions may include a planned meeting, such as a "town hall" meeting that was scheduled by students in February 2013, or an organically occurring "critical mass" of students, often in proximity to class meeting times. The number of students in the space at any given time fluctuates widely, based on the requirements of the course projects, time of day, and day of the week, frequently deviating by more than 20 students in a 15-minute period of time.

Designerly Talk

Talk about design might be seen as the primary content of the design studio, in one respect (Oak, 1998). In a study I conducted with a colleague on a portion of data from the Facebook groups used by these students, my colleague and I identified a more specific definition of this concept of designerly talk, used to "describ[e] communications that embody a critical character, express design judgment in a tacit or explicit way, and occur within a real community of practice around design" (Gray & Howard, 2014, p. 42). This designerly talk occurred at a higher level of discourse than everyday social conversation, with students often orienting their conversations toward everyday objects (e.g., video games, camera tripod, travel website), and then using those objects to discuss themes that were both critical and designerly in character (e.g., designing gender roles in video games, using a camera tripod to take shots from unique vantage points, user task flow in booking a flight). I take on the Gray and Howard (2014) definition along with the additional clarification, above, for this portion of the study, identifying the places where students are working as they might in a future design job, positioning themselves on the "studio bridge" (Brandt et al., 2013) in a preliminary practice community, where they take on the role of proto-professional designer.

The focus of this designerly talk is often directed at assigned course projects, with group projects dominating the curriculum for first year students. Many students came to the studio primarily to engage in group meetings for assigned projects, but arrived early and/or left late, working more casually in the studio when not in meetings. Surrounding the primary focus of pedagogically motivated projects, self-selected projects for design challenges, freelance work, and elective courses also emerged in the design studio. But even beyond planned design projects, a layer of criticality overlaid this designerly talk, with students using their newly gained skills in interaction criticism and design critique to assess the quality of a wide range of artifacts—from TV shows to web services to video games. Designerly talk also emerged in student-initiated upskilling

activities, which began to position the student toward their projected professional design community. The most common upskilling activity was the weekly Mad Skillz Club, where students shared skills in which they had proficiency (e.g., photography, typography, vector and raster editing), and led the other students in hands-on design projects until familiarity and early mastery of the selected tool was reached.

Projected Design Community

The student's projected design community refers to their orientation along the "studio bridge" between the academic and professional community of practice (Brandt et al., 2013). This category also approximates the content of the "identity invoking" genre of feedback posited by Dannels and Martin (2008). This type of interaction seems to have increased at the midpoint of the Spring 2013 semester as many first year students began looking for and accepting summer internships, and as second year students accepted full-time jobs. This pathway to an individual student's projected design community seemed to become more clear in the context of locating a job, and early forms of specialization began to occur—individual focus or interest in mobile app development, physical prototyping, user research, or advertising agency work emerged as each student identified the kind of work they planned to pursue as a design career (see a fuller exploration of identity construction from this cohort in Gray, 2014). Within this framing, I observed students evaluating the planned pedagogy, deciding which electives to take based on their personal design weaknesses, and occasionally protesting courses that they were required to take. Students also engaged in self-directed and internally planned activities that engaged their professional identity—from formal opportunities like the HCI/d Connect recruiting event to mock interviews to portfolio review sessions. All of these opportunities deemphasized the academic community in which they were acculturated, emphasizing the projected design community in which they intended to be a future member.

Relevant Speech Acts

In this interaction between two first year students (2014 cohort)—Liz and Stephen—in Spring 2013, they discuss a project they are working on in separate teams for their Methods course. Liz begins the discussion shortly after entering the space, "showing off" by reporting the data collection her group has already done for a shadowing project, commencing with a description of a preacher Liz's group observed. When Stephen seems interested, asking how she observed the preacher, Stephen has accepted Liz's bid for a conversation, and the discussion commences. A full transcription of this interaction is provided in Table 13, with initial analysis of acts in conjunction with the interaction types discussed previously.

Table 13: Conversation between Liz and Stephen

	Speech Act	Analysis
1	LIZ: [upon entering the studio space] I have two of three people done for methods already [spoken directly to Stephen, at an adjoining table] *(quote from field note 1.41)*	Liz "shows off" her project work as a way of instigating a conversation with Stephen.
2	*(The conversation begins with Liz describing her group's shadowing of a preacher for a Methods assignment, which requires each group to "shadow" individuals from five different professions. When Stephen seems interested in how Liz's group shadowed the preacher, I started audio recording. The remaining transcript is from audio recording 41.1 and analysis from field note 1.41.)*	Stephen presents a willingness to discuss her project, entering into "project talk."
3	LIZ: and I found out who that was and basically, uh, just sat in his office and talked to him and asked him what he does during his office hours typically. Cause I mean, for preachers, uh, there's a lot more involved than uh you know, the sermon part [laughs]	Liz segues directly into "project talk" from "showing off" with no social interlude—since Stephen is also working on this project, it appears socially acceptable to make this shift without social talk.
4	STEPHEN: Right	Bland encouragement, moving the conversation further, but without any directionality.
5	LIZ: We found that out! [laughs] It was nice.	
6	STEPHEN: What church did you do to?	Stephen seems to integrate into the conversation, asking for additional details.
7	LIZ: It's uh Church of Christ, it's way over on the west side.	
8	STEPHEN: OK—uh	
9	LIZ: We're trying to—we're trying to hit more of that since—since [another team member] has a car and I know the west side pretty well.	
10	STEPHEN: yeah, uh	
11	LIZ: But we also have a set up with um the owner of uh Sweet Liz Bakery.	

	Speech Act	Analysis
	We're going to go in before they start for the day and see what it takes—	
12	STEPHEN: Nice.	
13	LIZ: —to bake stuff—	
14	STEPHEN: That's awesome.	
15	LIZ: And uh, someone who works with the Buskirk Chumley—	
16	STEPHEN: That's a good idea	
17	LIZ: But a non-IU person that works at the Buskirk Chumley.	
18	STEPHEN: Yeah	
19	LIZ: We wanted to make sure we had that covered, so we're just trying to figure out one more. I'm trying to see if the—the roller derby uh league will let us go observe practice [laughs]	
20	STEPHEN: That would be—really cool.	
21	LIZ: Yeah, so—waiting to hear back from them. So that will be our [inaudible]. We've got like our ideas for the fifth person.	
22	STEPHEN: Yeah.	
23	LIZ: But yeah, no, we had the time. Like with the preacher, we set up ahead of time, but—cause I—I know his wife.	
24	STEPHEN: Yeah	
25	LIZ: That's kind of the idea, and for the uh—the antique store, we just walked in [laughs]	
26	STEPHEN: Yeah, that's uh—I'm supposed to be meeting with [my team member] and I think we're going to try and knock all this out.	Stephen moves from discussing Liz's project in an external sense to sharing his own project work. Perhaps this references Stephen's shift from social smalltalk to "project talk," even though Liz made this move from the start.
27	LIZ: Mmhmm. If you want like suggestions of places, just to— just to stop in on and do it that way, um like—	Liz switches from "project talk" back into a instigating mode, offering advice as a way of gaining entrance into "project talk" with Stephen. This may be motivated by social connections, helpfulness, or genuine interest in the project.
28	STEPHEN: We're thinking the library	
29	LIZ: Mmhmm	
30	STEPHEN: a church, um, I—I might have to do it individually, but like a delivery driver	Stephen and Liz have now completely switched roles in the conversation, moving from a descriptive account by Liz that began the conversation to a descriptive account by Stephen.
31	LIZ: Mmhmm	
32	STEPHEN: and that's about as far as we got.	
33	LIZ: Hmm.	
34	STEPHEN: But other than that, if there's any ideas you have, that would be cool.	Stephen mirrors and accepts Liz's previous bid to ask for advice, implicitly accepting Liz's previous offer.

	Speech Act	Analysis
35	LIZ: Yeah, so—I think so—church, library, delivery driver. So, hmm, uh, I would definitely check uh out any like hippie-type stores. Those type of people tend to be very friendly. Um, worst—worst case, you say, hey, would you mind showing, like you know, it doesn't have to be right now, you can set a time later.	Liz is now playing the role of a critic, offering advice and next steps to Stephen based on her experience doing this project.
36	STEPHEN: Yeah, and that's what—kind of what we were going to do. Just see if like a plan—	Stephen offers his plan for data collection in accordance with Liz's idea, apparently willing to accept any suggestions Liz might have.
37	LIZ: Yeah, I just—I just brought my camera like just in case, and it worked out with the antique store.	Liz implicitly understands and expands upon the data collection plan Stephen intends.
38	STEPHEN: Yeah, definitely.	
39	LIZ: People, you know, we just hit them at a good time. Um, but uh, yeah um, that's a good one, uh, fire stations.	Liz suggests another potential location for data collection.
40	STEPHEN: Yeah	
41	LIZ: What do they do?	Liz shifts the conversation away from the immediate project concerns in a more social direction. While there is a tangential relationship, this functions more as smalltalk.
42	STEPHEN: I guess they do things when they're not fighting fires.	Stephen accepts this new conversational direction.
43	LIZ: Yeah	
44	STEPHEN: What do firemen do? [laughs]	
45	LIZ: Well judging by the ones that live next door to me, uh, they sometimes sit out on the patio and play guitar, um—	While these details may seem extraneous, Liz is providing substantial concrete detail, which may relate back to the goals of the project in an implicit way. Project talk masquerading as smalltalk.
46	STEPHEN: See, yeah, it's stuff like that, though	
47	LIZ: They have to—they do do drills a lot, actually, and they do like—they have to maintain their vehicles and whatnot—	
48	STEPHEN: Yeah	
49	LIZ: They're always like—checking gear—	
50	STEPHEN: That's good. And that's close to where I live. I thought about cops, but—	
51	LIZ: Nah, I don't want to talk to cops [laughs]	
52	STEPHEN: I make it a point to avoid those [laughs]	
53	LIZ: Yeah [laughs]. I'm trying to think—yeah—yeah, but I'm trying to think who else—You know, I would actually have to check the town hall	
54	STEPHEN: Town hall?	
55	LIZ: Like over in the Showers building there, and seeing if there's anyone around. You know—	
56	STEPHEN: How long do you actually—how long does it last?	Stephen has altered the rhythm of the conversation for a second time, steering Liz away from

	Speech Act	Analysis
		specific sites for data collection, and toward his concerns about how to actually perform the data collection.
57	LIZ: Like an hour	Liz responds with her experience of data collection.
58	STEPHEN: OK, yeah, that's what—I wasn't expecting much more than that	
59	LIZ: Yeah, well I mean in the case of the preacher, it was more—more talking than doing. Like, it was mainly—I took a lot of pictures, but I didn't need all of them. But you know, we just kind of had you know, because he does—the first part of the day is mostly just you know studying things and coming up with sermons and like you know talking to people if they come in.	Liz then provides deeper detail into a specific data collection experience, seeming to provide more information than Stephen asked for.
60	STEPHEN: Yeah	
61	LIZ: And the afternoon he spends like going out, especially visiting old people. [laughs]	
62	STEPHEN: Yeah	
63	STEPHEN: I wonder—I wonder if we could, cause what we had talked about was trying to get a pastor preparing for Maundy Thursday or for the Friday service, so we could like capture that. But I don't know, we'll see if that's possible.	This more in-depth conversation about the preacher shadowing seems to surface another idea Stephen was considering, and he presents this to Liz for feedback .
64	LIZ: Yeah [..] well actually, you know, I'll take a slightly different perspective. You should check out like St. Charles or something like that.	Liz responds positively to the original idea, but redirects it based on her previous experience as an ex-Catholic.
65	STEPHEN: Yeah	
66	LIZ: One of the Catholic churches—	
67	STEPHEN: That could be cool.	
68	LIZ: I wouldn't suggest St. Johns—they're crazy—and they're also in Ellettsville.	Again, Liz is redirecting Stephen's efforts based on her personal, negative experiences of a specific site.
69	STEPHEN: Oh yeah	
70	LIZ: That's the church [inaudible]	
71	STEPHEN: There's a—	
72	LIZ: The reason I'm ex-Catholic	
73	STEPHEN: The only Catholic church I know—it's the one on 3rd and High, is that St. Charles?	Stephen disregards Liz's ex-Catholic statement, instead returning to the practicality of selecting a data collection site, confirming the location of a Catholic church.
74	LIZ: Yeah	
75	STEPHEN: OK	
76	LIZ: There's not very many Catholic churches around here.	
77	STEPHEN: Yeah	
78	LIZ: It's pretty much dominated by evangelicals. [..]	The lack of response by Stephen seems to indicate that the "project talk" has concluded.

	Speech Act	Analysis
79	LIZ: I'm going to work on my meaning and form assignment. I took the pictures last night, but I haven't put it together yet.	After a 30-second pause in the conversation, Liz makes another bid to enter into "project talk." She avoids the Methods project, and instead discusses her assignment for another class.
80	STEPHEN: Yeah, it's not like—that's the nice thing about this assignment is that the actual like putting the document together is—doesn't matter, like—[laughs]	Stephen accepts the initial bid to enter this interaction, but provides little project-related conversation in return, re-casting the conversation as smalltalk.
81	LIZ: Yeah	
82	STEPHEN: Although I guess unless you do what you did with the —[referencing a previous project with many photos]	Stephen continues to reference Liz's project work, but within a more social framing.
83	LIZ: Yeah, I know—like, I need to stop doing that. Cause that's a lot of work [laughs].	Liz accepts this reference to her previous work, and responds socially.
84	STEPHEN: Yeah	
85	LIZ: For this one, I have two pictures. [clarifying the lesser amount of work in this project]	
86	STEPHEN: Yeah	
87	LIZ: See the [inaudible]	After this speech act, the conversation concludes, when Stephen is unwilling or unable to provide a follow-up response to perpetuate the rhythm of the conversation.

Summary and Implications

Based on my analysis of this sequence, I identified settings and sub-settings, which begins to reveal the infrastructure of the setting and the importance of certain setting bids (especially at lines 1, 26, and 79) in shaping the overall interaction (Figure 66). At these critical junctures, instigating interactions can be seen in action, facilitating the movement from generalized social talk to content-specific project talk. While the project talk in this interaction bears some similarity to formal critique, both in genre (Dannels & Martin, 2008) and knowledge structures (Uluoglu, 2000), the instigating interactions represent an interesting device that is used to move between smalltalk and more designerly forms of interaction.

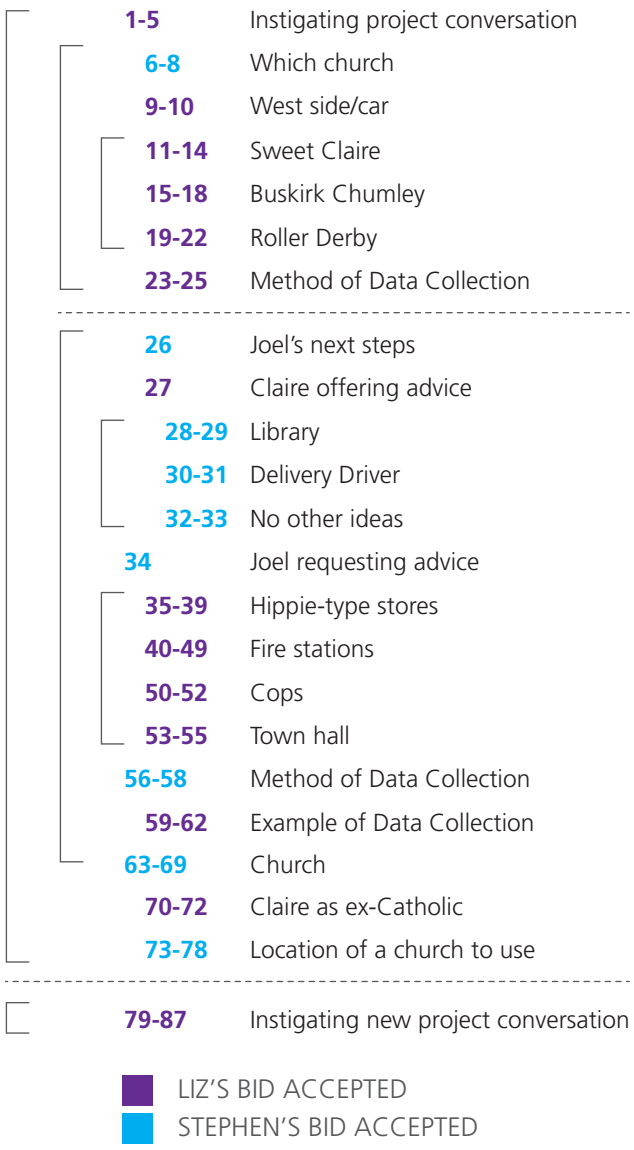


Figure 66. Sequence and setting analysis of the interaction between Liz and Stephen.

Note. All line numbers refer to the transcript in Table 13.

This interaction between first year students is indicative of a much larger pool of designerly talk that occurs in the studio space—away from the structure and institutionalized power relations of the classroom. Instead of academic norms of rightness or correctness, these students are using a more pragmatic basis for their actions, talking in equally social and critical terms about their design project. While significant amounts of research are still needed on the informal interactions between

students in relation to designerly talk, it is important to note here the field in which these two students are acting; while the project they are working on is being completed for academic purposes, the way they are sharing information about their approach and process is much more professional in orientation, with open discussion of relevant details. This interaction speaks to the norms of professional behavior rather than the evaluative norms situated in everyday classroom interaction.

Critique of CHI Posters

In April 2013, the ACM SIGCHI conference was less than a month away. Several student teams had submitted a version of their project for Marty's class to a student design competition, and three had been accepted. As part of this design competition, the teams were required to produce a poster of their project for exhibition at the conference; something they had not been required to produce for previous course projects.

Recounting the Event

As I entered the studio on a Tuesday morning in early April, two posters were hung on the wall between the two whiteboards, with a request for critique written onto the whiteboard (Figure 67) to the left of the posters, reading—"Please provide critique --> TY, Let's Chalk team ☺. Several students comment on the posters as they enter the studio, with mild discussion; at 10:01AM, Dwight enters the space and notices the posters hung on the wall. His immediate reaction is: "I'm just worried about the paint," and gets help from a student in the space to hang the posters up with magnets on the left whiteboard instead.

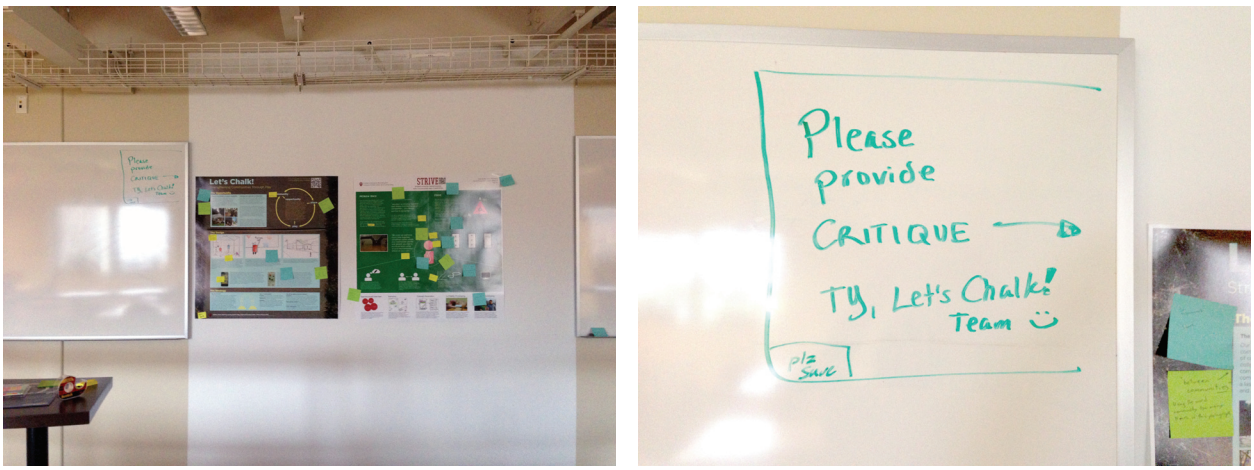


Figure 67. Posters hung on the wall before being moved (left) with notice on the whiteboard requesting critique (right).

Kent and Vamsi look at the comments on one of the posters (Figure 68), which seems to be their project, with Kent noting "we have a lot of the things we checked off the list." Marty talks with Dwight about a few issues, but doesn't directly comment on the posters. Around 11:45AM, Marty returns to the space, and while eating a cookie, starts to look over the posters more carefully. He is clearly not happy with the output, first leaving a comment on the whiteboard next to the poster reading: "It's shit"; after a moment of consideration, he erases that note, and replaces it with a new note, reading:

> *This is really*
> *bad. See graphics*
> *design books. Ask Edwin.*
> *Marty*

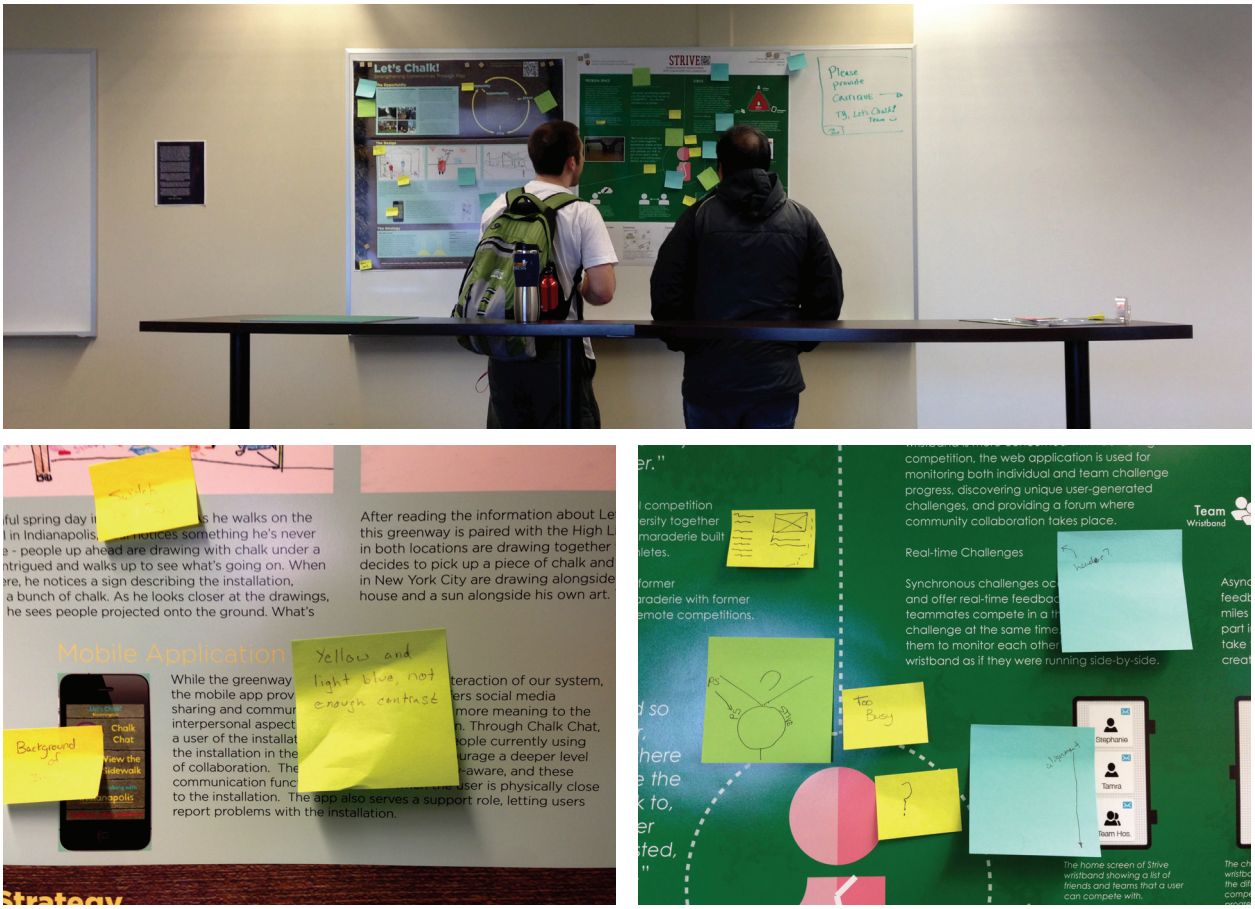


Figure 68. Kent and Vamsi viewing the posters (top), looking at some of the notes students had posted (bottom).

The PhD student Marty references in the note, Edwin, is pulled into the space by a second year student, RM, and after he enters, Edwin looks over the posters with Marty (Figure 69); they share a reasonably harsh critique of the posters. After this discussion, Marty erases the message one more time, leaving a final message to the team reading:

> *These are not acceptable*
> *Recruit a graphic*
> *designer ([Edwin]*
> *[Graphic Design instructor])*
> *Buy them beers. Marty*

Figure 69. Marty and Edwin review the posters (top), while Marty writes messages on the whiteboard (bottom).

Relevant Speech Acts

The speech acts surrounding the conversation between Marty, Edwin, RM, and myself are captured below (Table 14), as Marty negotiated the quality of the posters, with varying amounts of pushback from RM and Edwin. I played two different roles, initially agreeing with Marty to allow him to be comfortable to share his honest assessment, and then advocating for a more nuanced view of expected quality based on the students' training in graphic design, with Edwin agreeing with me. This conversation demonstrates the prevailing beliefs about critique from Marty, demonstrating the professor perspective; a lack of visual literacy skills as espoused by RM; and a harsh critique with an understanding of next steps from a professional design perspective from Edwin. These three viewpoints, with my voice drifting between the latter two, demonstrate the expectations of quality from students in this program, beliefs about the amount of visual design preparation students should have, and perhaps most importantly, a cultural assumption on the part of Marty that artifacts hung in the studio represented final artifacts, with an assumed intent of summative, rather than formative critique.

Table 14: *Group Critique of CHI Posters*

	Speech Act (111453 20130409, 35:00 – 45:30)	Analysis
1	MARTY: If this were in design school, it would just be ripped off of the wall.	Marty is visibly upset at the quality of the posters, making general comments about what should be done with poor design work.
2	COLIN: It would, it would just be ripped into pieces. [laughs]	I "play along" with his assessment to see if he will expound on his thoughts about the posters.
3	RM: If we walked into Marty's office, it would just be used as a placemat while people were eating cereal or something.	
4	MARTY: You know, let's put this up in the restroom—we'll put it up in the restroom and say, 'tear pieces off for your toilet paper.' OK. [Edwin enters]	
5	MARTY: OK, we have two teams who are going to CHI, and I just walked in here and they put up these posters (it's not these guys). And I said, Oh. My God. This is really bad	Marty has asked a PhD student with a professional background in graphic design to assess the quality of the posters. This begins a more formal, yet permeable, critique setting.

	Speech Act (111453 20130409, 35:00 – 45:30)	Analysis
6	EDWIN: It's chaos!	
7	MARTY: [writing on whiteboard] This is really bad. See graphics designer. Ask Edwin.	
8	EDWIN: [laughs]	
9	RM: It shouldn't be ask, it should be recruit.	
	…	
10	EDWIN: These are going to CHI? [laughs] What's wrong with this picture?	Edwin joins with Marty's previous assessment of the posters, wondering why the students thought this would be acceptable as final work. An underlying assumption that this is the final poster is never questioned by any of the participants.
11	MARTY: Don't bother going to CHI with this crap.	
12	RM: You should just underline 'really'	
13	EDWIN: Bold it! Bold it! — Wow. So. [inaudible] Do you know who did these?	
14	RM: The names are up on it.	
15	MARTY: I hope they weren't in your class. You know.	
16	RM: They're first years.	
	…	
37	EDWIN: So someone has already post-it noted them to death already here.	Edwin calls out the comments that have already been left on the posters. Interestingly, all of the comments students have left have been indicative of formative critique, most with concrete suggestions for improvement, while this discussion has been marked by a more abstract, stinging critique.
38	MARTY: What are they saying?	
39	COLIN: But those are all structural—	
40	RM: Yeah, it doesn't relate to the graphics aspect of it. Marty's the only one that's relating it to the graphics with those comments on the board.	RM mentions that Marty is the first to point out the lack of visual quality.
41	MARTY: I mean, where do they begin? This is the problem, Edwin, that we have with our students. And then they say, 'I don't have to take the graphics class.' Yes you do.	Marty reorients the conversation, using this instance to prove that students need more graphic design training.
42	EDWIN: [laughs]	
43	MARTY: And you wanted to get out of the graphics. [laughs]	
44	RM: The uniform text…	
45	MARTY: I mean, it—it, I mean can you imagine anything more amateurish?	Marty moves back to insulting the poster, interrupting a more specific suggestion from RM.
46	EDWIN: The problem is from this distance, that pattern is just like printer error.	

	Speech Act (111453 20130409, 35:00 – 45:30)	Analysis
47	RM: It's supposed to be—it's supposed to be a jersey.	
	…	
60	COLIN: And two years ago, they had [two alumni], so they were—they both need that kind of help. Because unless you—one class in graphic design will help you a little bit, but it won't magically create a great poster.	I provide some perspective on professional graphic design training, to see if Marty is willing to moderate his view.
61	EDWIN: Yeah.	Edwin accepts my bid and changes his tactic of critique to a more constructive, concrete critique.
62	COLIN: I mean that's something you only get from years of experience.	
63	EDWIN: Thank you! [laughs]	
64	COLIN: You can't learn it online.	
65	RM: I was going to say—that's why it's so hard for us to critique it, though, is because we had one semester and everything. But even after that semester, it's really hard to come up here and say, wow—	RM also accepts my bid for a more nuanced view of design preparation, explaining his lack of knowledge to do a visual critique, even after a semester taking the required course.
66	EDWIN: The major critique is there is just so much—	
67	COLIN: This one, though. Get the InDesign file, rip all of the content away onto the pasteboard, and then start figuring out what the hell there is. Because I can't—it's very difficult.	
68	EDWIN: Well—what needs to happen	
69	MARTY: If Dwight comes out here, he'll just start screaming.	Marty continues with the insult perspective, now transferring the insult from himself to another professor with interest in visual literacy.
70	EDWIN: The problem is these guys just don't know. How do you—how do you chastise somebody who doesn't know?	Edwin continues with a more nuanced view of how difficult this poster design is for someone with little training, serving as a foil for Marty's criticism.
71	COLIN: If you don't have a visual background—	
72	EDWIN: You can chastise them all you want—	
73	RM: See, that's why they put it up there for critique. I mean, you have to be blunt with them. You have to be—this is not—	RM then brings the conversation back to the nature of critique.
74	MARTY: This is not acceptable.	Marty accepts this bid to change the conversation, continuing with his former tactic.
75	RM: This is not good. But like I said though, it's hard for second years to even say, because while we do have a little bit [inaudible], we don't have the formal training that you have, Edwin. Like hearing it from us and hearing it from you are two totally different—	RM seems to react to Marty's continuing chain of insults, again aligning himself with Edwin's discussion of formal training, rejecting Marty's bid, even though he had begun the conversation.
76	EDWIN: [laughs]	
77	RYAN: No, but it totally is, though! Cause people know you're a graphics designer, because we don't —we don't have as much of a graphic arts background. It's more HCI related.	

	Speech Act (111453 20130409, 35:00 – 45:30)	Analysis
78	EDWIN: I honestly think that—oh geez—I mean you can really just take and drop the size of this text down one point size, open up some of these spaces,	
79	MARTY: Well the thing is, yes, you can't read from a distance, so you might as well make it small—	
80	EDWIN: Right, yeah	
81	MARTY: Because you have to come up to it anyway. And make something—have something that really—there's no—where do I go from—this was a little bit boom, boom, boom. This, I don't even know where to begin.	Marty adjusts his approach, acknowledging the poster and explaining his frustration by physically banging out a reading order on the poster.

Meaning Reconstruction

Drawing from this conversation, I have selected a composite of one of Marty's early statements in order to explore the meaning field that lies underneath. This meaning field also includes a split-audience phenomenon, with part of the field directed toward the second year student and PhD student in the room, and another portion implicitly directed toward the first year students, who were not present at the time this speech act occurred. Then based on this meaning field reconstruction, I build out a validity horizon based on the first main cluster of the meaning field to further explore the relevant norms, identity claims, and other validity claims that help to explain why Marty might have reacted in the way that he did (Table 15).

> Original speech act: *"If this were in design school, it would just be ripped off of the wall. […] Don't bother going to CHI with this crap."*
>
> "This design work is of unacceptable quality."
> (AND/OR)
> "This poster should not be taken to CHI."
> (AND/OR)
> "This poster is not up to the professional standards of the CHI conference."
> (OR/AND)
> "This poster will reflect poorly on this program if presented as is."
> (OR/AND)
> "I want to rip this poster off the wall."
> (OR/AND)
> "I am upset that the students created this poster"
> (AND/OR)
> "I am upset that the students hung this poster for critique"
> (OR/AND)
> "Students think this poster is the final design."
> (AND/OR)

"Students aren't working hard enough on their posters."
[Possible psychological state: incredulous, disbelief]

(AND/OR – split audience phenomenon)

TO EDWIN AND RM	**TO FIRST YEARS (NOT PRESENT)**
"I want you to tell the first years how disappointed I am." (OR/AND) "You should be as upset about the quality of these posters as I am." (AND/OR) "Help me spread the message to the students." (AND/OR) "I want you to know this work is not acceptable for any member of this program." [Possible psychological state: frustrated, balkanizing, disappointment]	"I'm disappointed in you." (OR/AND) "You aren't working hard enough to produce good work." (AND/OR) "You need to take more graphic design coursework." (AND/OR) "I want one of you to help me" [Possible psychological state: defiant, angry, disappointment]

Table 15: *Validity Horizon of Marty on the CHI Posters*

	Objective	Subjective	Normative	Identity
Foreground	I am commenting on the posters hanging on the wall. I am advising that students should not take this poster to CHI	I'm disappointed in the quality of the graphic design of these posters I feel the posters are not professional or complete	Students should be told if their work is poor.	I am the kind of person that "tells it like it is"
Intermediate	I am critiquing student work	I feel that the students who designed the posters didn't work hard enough I am able to critique the visual quality of a design	Students should produce good work when presenting at professional conferences Only good work deserves to be displayed and/or critiqued Good teachers tear apart student work to make it better	I am a good mentor and teacher I am the kind of person that saves students from being embarrassed by presenting poor work I focus my critique on the visual quality of the presentation
Background	We are not in a design school	I feel the students need more graphic design skills	Students should be ashamed when they produce poor work	I am a gatekeeper for the quality of work in the this program

Objective	Subjective	Normative	Identity
	I am frustrated that students thought this level of work was acceptable	Students should be publicly shamed when they do poor work	

Summary and Implications

As noted in the validity horizon and meaning field reconstructions, above, there is a conflicting quality to some of the norms. By all accounts, Marty is an amiable professor, and cares deeply for his students. Yet there seemed to be a latent assumption on his part that one should not produce poor work and display it in the studio space; that if work was hung in this way, the underlying assumption was that it was complete and final, and should be critiqued as such. This matched with the summative critique that was common in Marty's courses, but did not reflect the formative critique more common in student-to-student interactions.

Students did not make the same assumptions that Marty did about the "final" nature of their poster design, readily posting Post-It note comments on the posters the evening before this interaction with Marty occurred. The students implicitly understood that this artifact was a work-in-progress, possibly because of the context provided by a Facebook post encouraging feedback (Figure 70), or because for them, the studio served as a place largely for formative critique, not summative critique. Adam, a student who helped to design one of the posters, remarked that the backlash over the posters being hung pointed out that the critique process was "not happening right"—that it privileged only summative critique; even though he explained to me that he and his teammates got "lots of flack" from Marty for hanging the posters, he did feel that it broke down that wall of not being able to hang stuff [on the walls]," which was a victory that began to change the nature of work being posted for consideration (Interview, 05292013).

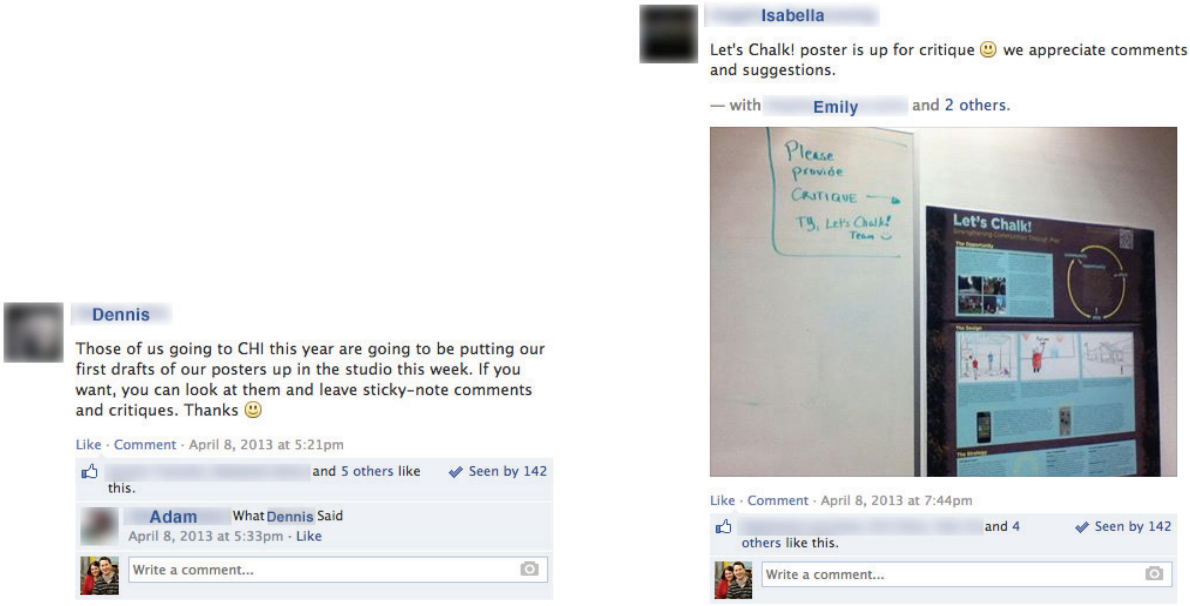


Figure 70. *Facebook posts from two different teams requesting critique on their posters the night before the incident with Marty occurred.*

This incident exposed implicit beliefs about the nature of critique, the kind of work that can and should be shared in the studio environment, and the varying interpretations of these beliefs on the part of students and professors. While students seemed to innately understand that the posters were works in progress, and should be constructively critiqued as such, Marty (and initially Edwin as well), assumed that the posters represented a finalized design. Part of this confusion could have stemmed from a bias towards low-fidelity prototyping for early design activity, socialized in Marty's introductory design course. In that course, sketching wireframes and similar visual representations was advocated as the "cheapest" way to iterate and get feedback, with high-fidelity visual representations appropriate only once the primary design elements were agreed upon and shown to be well constructed. While no explicit support was provided for the construction of posters until the capstone experience, Marty seemed to assume a certain level of visual competence on the part of the first year students, particularly if they had taken the graphic design course for non-majors. Ultimately, there was a clash between the assumptions of the first year students—that critique

should be embraced at all stages of the process, and that feedback should be constructive and generative—and that of Marty, who seemed to view and interpret the designed artifact primarily through the lens of academic appropriateness, with its high fidelity indicating the degree of completion.

Cohort Meeting

Throughout the Fall 2013 semester, momentum was building towards the formation of a formalized meeting that was organized by first year students for first year students. As discussed chronologically in chapter five, the instigation for this meeting as the perceived lack of cohesion on the part of the first year cohort, and their unwillingness or inability to engage with mentors and collaborate in the ways Marty and the mentors thought were appropriate. The students also desired this meeting, feeling that they needed a public venue to air their concerns, their grievances, and their path to improvement. This vignette is unique because it is the only one of these six for which I was not present. To counteract this limitation, I interviewed several of the key students involved in organizing the meeting, and captured the reflections of several other students that were present. This discussion and analysis is less focused on explicit speech acts, and more on the power structures, perceptions of community, and threats to that community as perceived and experienced by the first year students. This analysis leads to a conversation about cohort dynamics, expectations of progress in designerly development, and the legitimation of informal student learning.

Organizing the Meeting

As the semester wore on, Marty's comments about the first years not performing up to his standard became more common. By the fourth project in the introductory design course, many students were frustrated—both with their progress as designers, and their ability to collaborate and interact in the ways they were being asked to by Marty and the second years. Sonya, one of the dominant females in the first year cohort explained: "we are constantly being compared to the second years," especially by Marty; and she felt a sense of disappointment, which was shared by

the rest of the cohort and that she wanted to bring up in their town hall—an underlying sense of "paranoia" (Sonya, Interview, 11202013). Anusha also experienced the same comparison between cohorts, but rejected this sentiment, saying: "People keep comparing cohort to the second years, and I don't know why they do that—it's fine" (Anusha, Interview, 12102013). Sonya also mentioned more specific things the cohort felt they were lacking, such as critique not happening outside of class; the cohort is starting to think about critiquing each other more aggressively, but "it took this long to acknowledge it"; in addition, Sonya felt that there are issues of competition and trust that the cohort needed to work through, but has started to see good comments from her colleagues in class recently (Sonya, Interview, 11202013). Danielle was worried about leading the event, but also felt: "I didn't want to be a know-it-all"; this concern was overshadowed by her observation of "people not being here [in the studio]," which eventually led her to be one of the primary organizers. She felt as if the second years thought the first year cohort was distant—which, while she didn't believe this was true, she was motivated to be more outspoken to change things because "I didn't want another lecture…I don't want to feel that way anymore" (Danielle, Interview, 12112013).

A quieter first year student, Brad, took a contrary view, sharing with me during an informal interview that the cohort was just "overreacting" about Marty's comparisons and threats; even though Brad rejected the comparison, he admitted that the second years are "brilliant, and I can't figure out why…I just want to know [Stephen's] thought process; how he comes up with the ideas he does." Ultimately, he agreed with the other first year students that he needed to talk to more people in order to get better—something he was still struggling to do at the end of the first semester (Brad, Interview, 12132013).

Marty worked behind the scenes to encourage the students to create such a meeting, targeting students who, he felt, had leadership potential in the cohort and might be willing to organize the event. Many of the students I talked to knew of Marty's involvement, and from my

interviews, Marty had lunch with or otherwise approached at least five students—Alec, Danielle, Alexis, Sanjiv, and Alec—in his attempts to get the cohort meeting off the ground. Danielle was the one to finally instigate the meeting, but after deciding to launch the meeting, networks were formed with the would-be organizers. Alexis had been "waiting for someone else to do it," but that Marty had told her "you don't have to do it alone" (Alexis, Interview, 12172013). She knew that several people were told the same thing by Marty, and they informally connected at a bar after a special class meeting on the evening of November 11th. According to Alec, Marty had also talked to him and Sanjiv, but Sanjiv didn't want to lead since he thought he had a "in your face" reputation with the first years. Alexis was ultimately the person to send out the Facebook status update announcing the event, and all five of these individuals led the meeting to varying degrees—Sanjiv to a lesser extent.

So, with all of these personal connections finally in place, Alexis sent out a Facebook status update announcing the meeting (Figure 71), and word-of-mouth ensured good attendance from the first year students. By the time event occurred it was wholly a student-led event, even students outside of the leadership circle that formed were aware of outside involvement, with Sonya explaining that she knew "Marty was somewhat behind [the town hall]" (Sonya, Interview, 11202013).

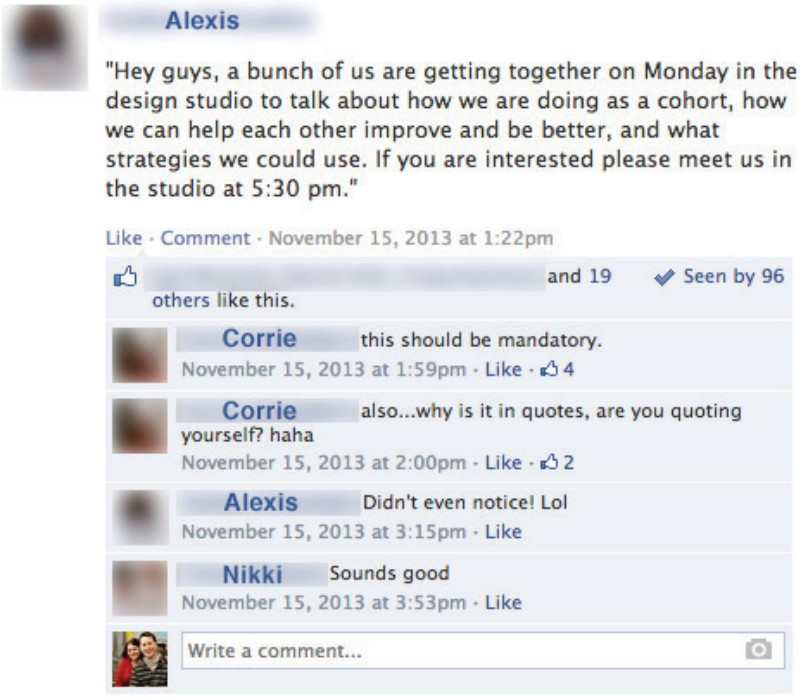


Figure 71. Status update in the 2015 cohort Facebook Group from Alexis announcing the cohort meeting.

Figuring it Out

Once the meeting time was set, the students assembled in the studio space on a Monday afternoon; a time the organizers knew the second years would be in their required prototyping class. I was not even aware the meeting was going on, having missed the Facebook update, but walked up to the studio during a break to talk with Marty in his office and noticed the studio full of first year students. Even given the relatively quick planning, around two-thirds of the cohort was reportedly in attendance. Some of the students wanted to ensure it would be exclusive to first years so they could talk openly, and because some of the students might feel defensive if others were there. According to Alec, there were "noticeable absences" of students he felt hadn't bought into the program as much. He claimed that the meeting "helped us to air things out" and help each other out; there had been some attempt at these discussions in a more formal setting during

Therapy, led by Marty, but it was often the "same old faces" that got up to tell their stories (Alec, Interview, 12032013).

During the meeting itself, Danielle, Alexis, Sanjiv, and Alec led the discussion, talking about a number of the big issues that had been at the center of the comparisons between cohorts: a lack of perceived engagement on the part of students, a lack of communication and critique between design teams, and a lack of presence in the studio. As the students talked, Alexis wrote bullets on the whiteboard during the formal discussion (Figure 72), documenting the main points of discussion. She reported that the students were "quiet in the meeting"; that the organizers didn't want it "to be preachy" and asked the other students to "say whatever they are feeling…how can we help each other improve" (Alexis, Interview, 12172013).

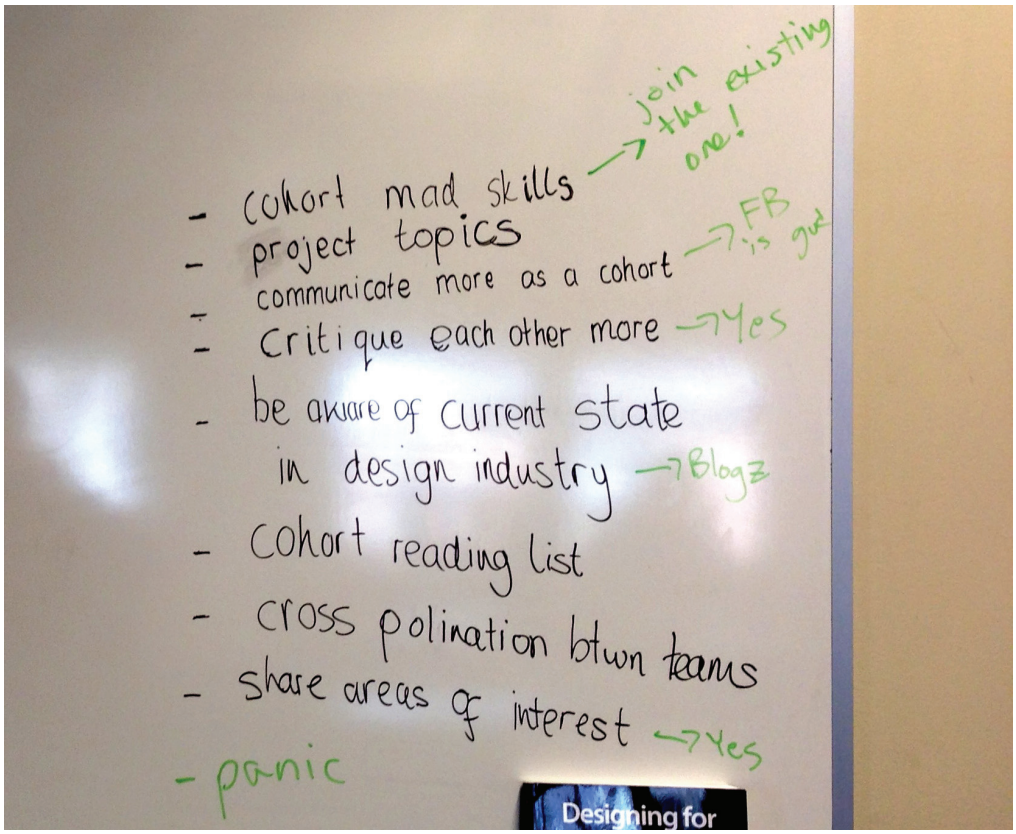
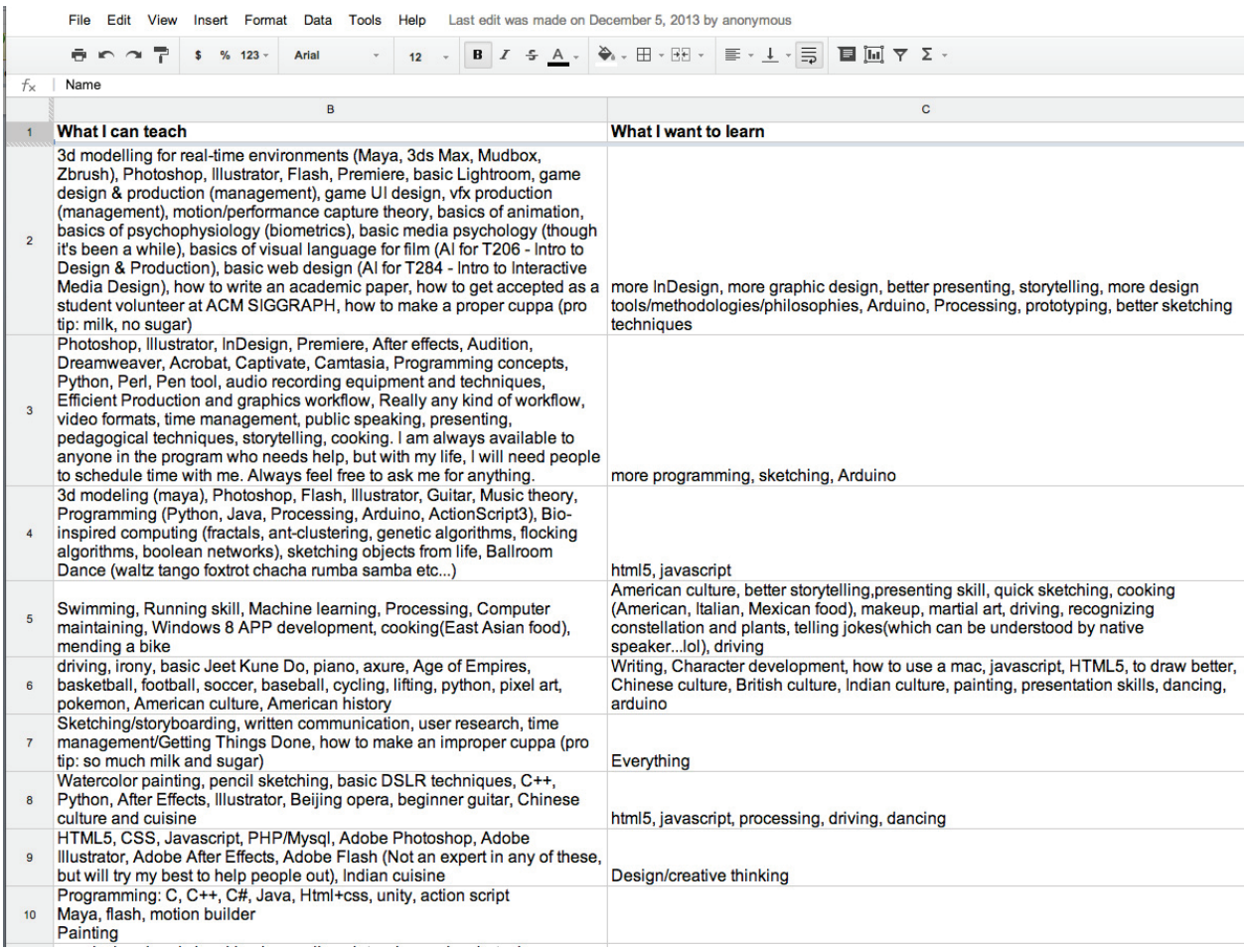


Figure 72. List of desired outcomes from the first year cohort meeting.

The students seemed to struggle in the meeting to determine how to change the state of affairs, with Sanjiv advocating for students to shadow second year design teams to see how they worked; Keisha agreed with this sentiment to some degree, but didn't see the need to observe the second years: "I assumed it would come from practice" (Keisha, Interview, 12052013). Cameron questioned after the meeting, based on the issues that were discussed, whether the cohort was "too stubborn…people that are resistant to thinking in David or Marty's way"; he thought that the issue was that everyone was trying to "do everything really, really well" but can't break out of that perfectionism and drive to look at the bigger picture (Cameron, Interview, 12112013).

The Aftermath

During the meeting, the first year students mentioned the importance of people talking with others about their projects and pulling outsiders into their meetings. This meeting also sparked an online spreadsheet, led by Alec, intended to document things that people want to learn or teach to others, distributed through the cohort Facebook group (Figure 73). This reflects a sentiment that arose in the cohort meeting that Mad Skillz Club had previously been "by the second years for the second years" and that they want to host their own meetings instead, which reflected their interests and needs. This feeling was not universal among the students, with Keisha reflecting that she thought the interactions in the Mad Skillz Club meetings led by second years were collegial, but she just couldn't find the time to attend. Alexis mentioned that people seemed to be communicating more after the meeting, which she saw as a positive step.



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Name

	B	C
1	**What I can teach**	**What I want to learn**
2	3d modelling for real-time environments (Maya, 3ds Max, Mudbox, Zbrush), Photoshop, Illustrator, Flash, Premiere, basic Lightroom, game design & production (management), game UI design, vfx production (management), motion/performance capture theory, basics of animation, basics of psychophysiology (biometrics), basic media psychology (though it's been a while), basics of visual language for film (AI for T206 - Intro to Design & Production), basic web design (AI for T284 - Intro to Interactive Media Design), how to write an academic paper, how to get accepted as a student volunteer at ACM SIGGRAPH, how to make a proper cuppa (pro tip: milk, no sugar)	more InDesign, more graphic design, better presenting, storytelling, more design tools/methodologies/philosophies, Arduino, Processing, prototyping, better sketching techniques
3	Photoshop, Illustrator, InDesign, Premiere, After effects, Audition, Dreamweaver, Acrobat, Captivate, Camtasia, Programming concepts, Python, Perl, Pen tool, audio recording equipment and techniques, Efficient Production and graphics workflow, Really any kind of workflow, video formats, time management, public speaking, presenting, pedagogical techniques, storytelling, cooking. I am always available to anyone in the program who needs help, but with my life, I will need people to schedule time with me. Always feel free to ask me for anything.	more programming, sketching, Arduino
4	3d modeling (maya), Photoshop, Flash, Illustrator, Guitar, Music theory, Programming (Python, Java, Processing, Arduino, ActionScript3), Bio-inspired computing (fractals, ant-clustering, genetic algorithms, flocking algorithms, boolean networks), sketching objects from life, Ballroom Dance (waltz tango foxtrot chacha rumba samba etc...)	html5, javascript
5	Swimming, Running skill, Machine learning, Processing, Computer maintaining, Windows 8 APP development, cooking(East Asian food), mending a bike	American culture, better storytelling,presenting skill, quick sketching, cooking (American, Italian, Mexican food), makeup, martial art, driving, recognizing constellation and plants, telling jokes(which can be understood by native speaker...lol), driving
6	driving, irony, basic Jeet Kune Do, piano, axure, Age of Empires, basketball, football, soccer, baseball, cycling, lifting, python, pixel art, pokemon, American culture, American history	Writing, Character development, how to use a mac, javascript, HTML5, to draw better, Chinese culture, British culture, Indian culture, painting, presentation skills, dancing, arduino
7	Sketching/storyboarding, written communication, user research, time management/Getting Things Done, how to make an improper cuppa (pro tip: so much milk and sugar)	Everything
8	Watercolor painting, pencil sketching, basic DSLR techniques, C++, Python, After Effects, Illustrator, Beijing opera, beginner guitar, Chinese culture and cuisine	html5, javascript, processing, driving, dancing
9	HTML5, CSS, Javascript, PHP/Mysql, Adobe Photoshop, Adobe Illustrator, Adobe After Effects, Adobe Flash (Not an expert in any of these, but will try my best to help people out), Indian cuisine	Design/creative thinking
10	Programming: C, C++, C#, Java, Html+css, unity, action script Maya, flash, motion builder Painting	

Figure 73. Google spreadsheet documenting first year students' interest in teaching and learning a variety of concepts.

Alec felt that there were naysayers at the meeting, and that these individuals "could be really good if they were more onboard [with the program]." He mentioned that Sanjiv recommended that the students look more into how the second years work—like Sanjiv had been doing, and shared in the meeting—but met resistance from some students who saw this as a furthering of the comparisons between cohorts, which they felt "was getting old" (Alec, Interview, 12032013). Anusha acknowledged some gains made during the town hall meeting, but didn't feel like anything happened based on the meeting, largely because there was not enough time with the press of projects at the end of the semester. She mentioned during our interview that she had seen

students sharing and doing reading groups, which is a positive move based on the goals set in the meeting; implicitly, the second years "set a standard" that they, as first years, are not currently meeting, but "I'm not too worried about it." Ultimately, Anusha still felt troubled by the comparison, and it was unclear whether the comparison itself was at issue, or a latent feeling that they were not doing enough to improve their performance as designers: "Maybe we're not reaching out enough—if the cohort is failing, maybe we're not reaching out enough. I don't know, stop comparing us to the second years, I guess" (Anusha, Interview, 12102013).

Summary and Implications

Underneath this process of organizing and executing a cohort meeting, several important issues are raised to the foreground. While the conversation about the need for a meeting was instigated by Marty and developed by first years, the second year students also contributed to a climate where students felt as if they were behind in important ways. In addition to an environment that allows for a meeting like this to emerge, the issue of cohort leadership and composition, and legitimation of informal learning and student governance also raise important concerns about how students picture their role in relation to the formal pedagogy.

In addressing how a cohort develops over time, there was a felt need on the part of the second year cohort for students to look like them—or at least how they imagined they looked—at the same stage. This lack of met expectations on the part of second years was compounded by Marty explicitly telling first year students that they were "behind." Two main questions stem from this comparison-oriented environment: 1) how does personality shape what a cohort looks like from the outside?; and 2) what happens when the leaders in the cohort aren't loud, white Americans—when students are more shy and contemplative; more unsure; less bold? While the second year students were vulnerable and less self-assured during their first year, they consistently had a set of dynamic leaders that led them, more or less, in a confident manner. The 2014 cohort overall could be described as outgoing and assertive. The 2015 cohort, however, came across in my

interactions as much more shy and uncertain, with many of the emergent leaders—such as those targeted by Marty in the planning process—much more tentative and introverted than their second year counterparts. It is unclear whether the program, led in many ways by Marty's expectations for the group, are bound to a specific cohort "personality," and if this variance in personality caused this perception of being behind.

Another substantial issue that I feel this vignette raises is the role of professors in the everyday affairs of students. Marty showed disappoint with the cohort in a public, classroom setting, and was the main individual that promoted negative comparisons between first and second year students. However, Marty's actions "behind the scenes" were qualitatively different; he seemed to want to give the students tools to counteract these same comparisons and make a change in their cohort in a more guerilla-like fashion. This is consistent with Marty's overall approach, privileging informal student community, as with his encouragement of the student panel during orientation. Any full accounting of the pedagogical experience must include not only the formal messaging found in the classroom, but also the back channel communications, informing the creation of a student-directed space where an alternate message could be heard. In this division of formal and experience pedagogy, we can also see a furthering of the division between the academic community and the proto-professional community; the former, where the comparisons between cohorts resided in a formal classroom setting; and the latter, where students led their own informal education to better themselves individually and collectively as designers, first and foremost.

CHAPTER 8: Discussion and Implications

In this chapter, I will attempt to draw together the complex, layered narrative accounts of student experience in the fall and spring semesters from chapters five and six and the more detailed reconstructions of several pivotal events during these two semesters in chapter seven, identifying more clearly the system relations underlying these actions. In particular, I will focus on how students build an identity for themselves, often distinct from the circumscribed reality represented by the program faculty and curriculum.

The concept of *content inference fields* (Zhang & Carspecken, 2013) is used to discuss some of these relations, demonstrating the overlapping of and disjuncture between the *scholarly discourse*—oriented towards standards of academic "rightness" and often situated in a student role—and the *practice discourse*—oriented towards a situational pragmatism centered on a market context, and generally situated in a designer/practitioner role. To explore these fields further, I will elaborate system relations through Carspecken's (1996) phases four and five, which focus on the system relations which lie underneath communicative interaction in a given context, and how those system relations can be understood as part of a larger social system. The system here represents the entity which allows for the coordination and reproduction of actions across multiple contexts and actors; system structures relate to the system, and are claimed through communicative acts, thereby reproducing or introducing variation into the system.

Phases one and three are discussed comprehensively in chapter three, and focus on building a primary record through engagement with the ethnographic context and extending that record through dialogical data generation. Phase two is introduced in chapter three, and then extended through reconstructive analysis of five vignettes in chapter seven. The work presented below is a primarily analytical contribution based on the data collection and analysis in phases one, two, and three, answering the third research question: What structures exist and are propogated by students, and how do these structures relate to the assumed structures of the formal pedagogy?

Phase Four: System Relations

The system relations focused on in this study are an outcome of Carspecken's (1996) phase four of critical analysis, orienting the findings of this critical ethnography toward existing theoretical knowledge about studio pedagogy and studio culture in emergent design disciplines. First, I will discuss some of the structure-system relations that have emerged in this study, based on the narrative and analytic accounts provided in the last three chapters. I will then use these structures to create a more holistic rendering of how the system reproduces over time, explaining, to some degree, how this program relates to the professional practice community, and participates in the education of future designers.

Structure-System Relations

The structure-system relations discussed here are indicative of the student and faculty experience of this program, in that these relations shaped what kinds of actions could take place, and, through a variety of structures, culturally legitimated and reproduced these actions over time. The system does not determine action, but does help to explain how the illocutionary settings of the program are related to larger system forces. In particular, I will address the structure-system relations as they relate to two dimensions: 1) the temporal dimension—what happens in the formal education years versus what happens once the student joins the practice community, or the student years versus the career years; and 2) the spatial dimension, which deals with the context of action, as students move from the university environment into professional practice.

Formal and Informal Education

Students immersed themselves in the formal pedagogy, but just as quickly, they created opportunities for informally educating each other. They saw this as a way to ensure they would get a good job, by engaging in consistent upskilling, both internally (e.g., Mad Skillz Club, critiques, design challenges) and externally (e.g., professional conferences, IXDA meetups, alumni functions). Because of this constantly building skillset, with tool knowledge largely developed outside of the

classroom, they have a skillset that is in demand, and they are able to communicate that skillset through project work, which stems primarily from the formal curriculum. The formal curriculum provides a vocabulary and shared set of experiences for students to relate to one another (e.g., introductory design course, core methods, theory), but it is largely the students that extended that vocabulary and set of experiences to be relevant to professional practice. In this HCI/d program, the faculty were generally aware of these out-of-class activities, but did not rely on them in required course activities. Many of the activities referenced above constituted additional practice and acquisition of skills not directly taught in the program, which, regardless of their disconnection from the formal pedagogy, nevertheless produced student work that was more nuanced and technologically aware than work that only relied on formally taught skills. Temporally, students did not distinguish between the kinds of learning they would need to undertake to be a good student or a competent professional. Similarly, the forms of interaction perpetuated by students in the studio space were not spatially bound, with informal educational endeavors located in the studio bearing substantial similarity to those found in the context of local IXDA chapter meetings and other alumni functions.

Internship

Beyond the formal pedagogy, students were encouraged to locate a summer internship, even though the vast majority of students did not take it for academic credit. Students used this opportunity to try out the things they had learned in an authentic context, often being challenged along the way (Gray, 2014) to justify or defend their identity as a designer, building an understanding of the value of the formal pedagogy, and where they were still lacking in skills and theoretical knowledge. Often, this internship reminded students that they needed more education—more theory, more practice—before taking on a full-time position. This internship also had the benefit of constantly bringing back new and current experiences to the next cohort and program faculty—and where legitimated (see below), allowing for changes in the pedagogy to

meet the evolving demands of practice. The internship was located in a spatial sense almost completely in professional practice, with only the necessity of returning for a second year of education reminding the students of their academic role. While the students were completing their internships, however, there was a powerful recognition that the internship experience inculcated a desire for more formal education; thus, in a temporal sense, the internship reminded the students of their student role, and their need for additional knowledge, which ES and Marty relied on in their second year courses.

Cohort and Community

The cohort system provides a shared internal network among students that is maintained, to varying degrees, after graduation. Although this cohort is self-referencing to the other cohort that is residentially co-located, it also extends through digital space to other cohorts as well, mediated through a shared culture, vocabulary, and set of experiences that has been propagated by the formal pedagogy, faculty, and students. The curriculum has been relatively stable in the last 5-7 years with many practicing students from those years forming a core that have built out the alumni network in a variety of companies; the cohort size has also gradually increased over time (from 35 in 2012 to 42 in 2014), so this core is also quite substantial. This network is informed and in some sense "birthed" from the formal curriculum/program, but takes on a life of its own after graduation as a force in its own right. The alumni and current students talk frequently about taking on this responsibility—both as a way to tangibly give back to the program, and to justify and ensure the quality of the degree they hold, ensuring its reputation for cohorts to come.

Related to building an alumni network, students are able get good jobs because alumni have good jobs, professional connections, and a deep understanding of the industry. The reputation of the program—with that valuation coming from a composite of graduates—is what gets people jobs, not necessarily the content of the program in a direct way, although the formal pedagogy formed the core knowledge and shared vocabulary that made this core of alumni

possible. These bonds are reinforced during several events each year, including the HCI/d Connect recruiting event in the spring semester, where students vie for internships and full-time positions, alongside more informal "alumni weekends" and visits from alumni throughout the year.

The cohort system, then, relies on numerous structures that maintain and reproduce the system, including the building of a shared vocabulary and culture, and the continuation of communication after graduation through communicative structures like the Facebook groups. The system supports functions that include getting new graduates good jobs, informing the formal curriculum, and ensuring the reputation of the program at large by upskilling themselves. The cohort system formed an organizing metaphor that, while altered once the students moved into professional practice, nevertheless was responsible for much of the sense of community that students relied on once they graduated from the program. In this way, as the spatial dimension of the system changed—from collocated students in a residential program to distributed designers throughout the world—methods of communication socialized through the system altered to meet the new temporal realities. Throughout the educational experience, students had relied on the student-led Facebook groups to communicate with their cohort; but in professional practice, many alumni used the All Years group as a lifeline to connect with the program—both to their former experience as a student, and their current role as a design professional.

Mentoring

The mentoring system embedded in the introductory design course, and led by Marty, forces interaction between students of differing levels. Marty's rapid design course similarly forces interactions between second year students and alumni, where the alumni play a professional role, not as personal as in the Facebook group. This constant cycle of mentoring through two courses, one required and the other highly attended, creates a cycle of mentorship and sharing of processes, resources, and tools that is replicated as students go out to work in professional practice. While second year students are still in the program, they bring back a culture of authentic design practice

from their internships, which is legitimated and brought into the classroom in a direct way by Marty in the introductory design course. As Marty explains, this mentoring works because students are much closer to their own introductory design experience, and learn almost as much from the experience by mentoring students in the naïve state they inhabited only a year previously. The mentoring relations built into the system by this one professor substantially relates to the development of cohort and community, referenced above. While the temporal qualities of these relations, in an immediate sense, are quite limited (lasting only one semester), the long term implications of the mentoring subsystem, or set of relations, feed back into a variety of other system components. For instance, mentoring provides a legitimated place for second year students to pass on their expertise (e.g., informal education) in an academic context; but over time, this mentoring role taken on by students is transformed into a focus on design leadership as the student moves into professional practice. This translation of skills and behaviors appears to be both spatially and temporally integrated, reproducing desirable student behaviors in the academic context, and informing the student's eventual approach to leading as a design professional.

Authentic Interaction with the Practice Community

Regular attempts are made in several portions of the formal curriculum and related events to motivate interactions with alumni and other UX practitioners. Marty engages students in authentic projects with professional UX designers out in the field through his rapid design course—spanning a wide range of companies, design problems, and personalities. While the lead contacts are generally alumni, they are often accompanied—in problem framing, presentation, question answering, and critique—by designers and/or managers who did not graduate from the program, thus encouraging communication with designers and other individuals that may not share the same vocabulary and core competencies. Students also engage with the practice community during the annual student-led HCI/d Connect event in a more informal way. This is a recruiting event, but with a designerly twist; students participate in design challenges so the company representatives can see

them and their work in action; and professional portfolios and resumes are created to market the individual and create opportunities for conversation around their individual approach to design and HCI. These regular interactions with the practice community serve as vital links between spatial and temporal dimensions of the system, relating students to their future professional role while they are still located in the academic context. The connections between students and design professionals also serves to strengthen the cohort and community bond, reminding the students that, as they move from their student role to a professional role, there is a constant presence of students that will need them on the other side. Marty described this relation as a call to "give back" to the academic program once students graduated and joined the practice community, and can be seen as a formal link between the academic and professional spatial contexts.

Other Structure-System Relations

In addition to the other structure-system relations listed above, faculty also engage in research, often informed by the practice community. This is especially the case with ES and Marty, who have been engaged in a grant to study the use of methods in professional practice, and the implication of this use for design pedagogy. This research has the potential to inform an evolution of thinking about the role of design education, and directly impact the way a pedagogy is carried out; ES and Marty explicitly mention using this form of research to inform discussions and to adapt their pedagogical approaches in the classroom over time.

Embedded Roles and Typifications

There are two main roles that I found to be evident in the program experience (Figure 74)—that of *student* and that of *early practitioner* or *proto-professional designer*. The former role is generally the one expected of someone in an academic program, along with the typifications and norms that generally come along with it. When outside of the formal pedagogy and in the studio with peers, students are able to take on a proto-professional role, especially in relation to first-year students or others in the design community. This new role brings with it a new set of typifications

and norms—with an orientation towards practice and their identity as a designer and less focus on traditional student concerns such as grades or meeting classroom expectations. For instance, while a student taking on a student role engaged primarily or exclusively in summative critique—a standard typification found in the classroom experience of this program—that same student, while taking on a proto-professional role engaged primarily in formative critique or critique as a natural form of designerly communication—a very different typification than the classroom mode, which cast critique as primarily evaluative. The proto-professional role seems to generally subsume the student role, with any issues of quality or rigor heightened; proto-professionals do not merely desire to meet expectations outlined in the project brief, but satisfy their desire for quality as a professional designer might. Ultimately, project work was repackaged and repurposed for the students' professional portfolios, so the blending of these roles is not unexpected. However, students appeared to be more flexible in switching fluidly between roles, while professors and associate instructors seemed more fixed in the academic mode.

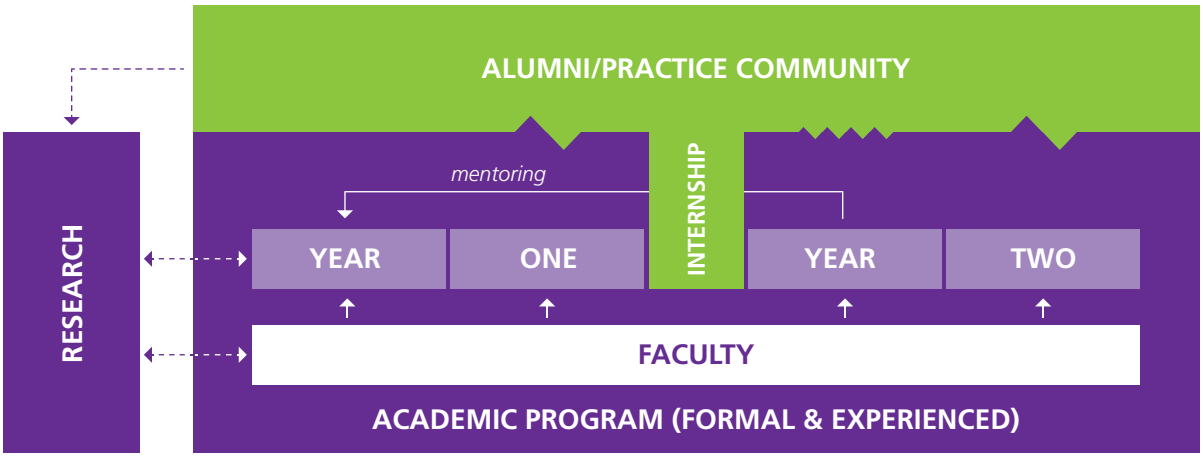


Figure 74. System relations between the alumni, student, and faculty communities.

In this enactment of varying static and fluid roles, there is also a potential for roles to come into conflict, if and when they are played out in contexts that are inappropriate. For instance, tensions emerged in cases where the norms of the classroom conflicted with the proto-professional

role a student was attempting to live out. In Figure 75, I expand the purple area from Figure 74 referencing the formal and experienced academic program in order to demonstrate how students took on different roles *as students* while enrolled in the academic program. While this switching of roles was relatively infrequent in a classroom setting, there were several occasions in which students wanted to understand and justify the pedagogical decisions being made within the framing of practice, while associate instructors and faculty often oriented their responses toward a student role, rather than that of a proto-professional designer.

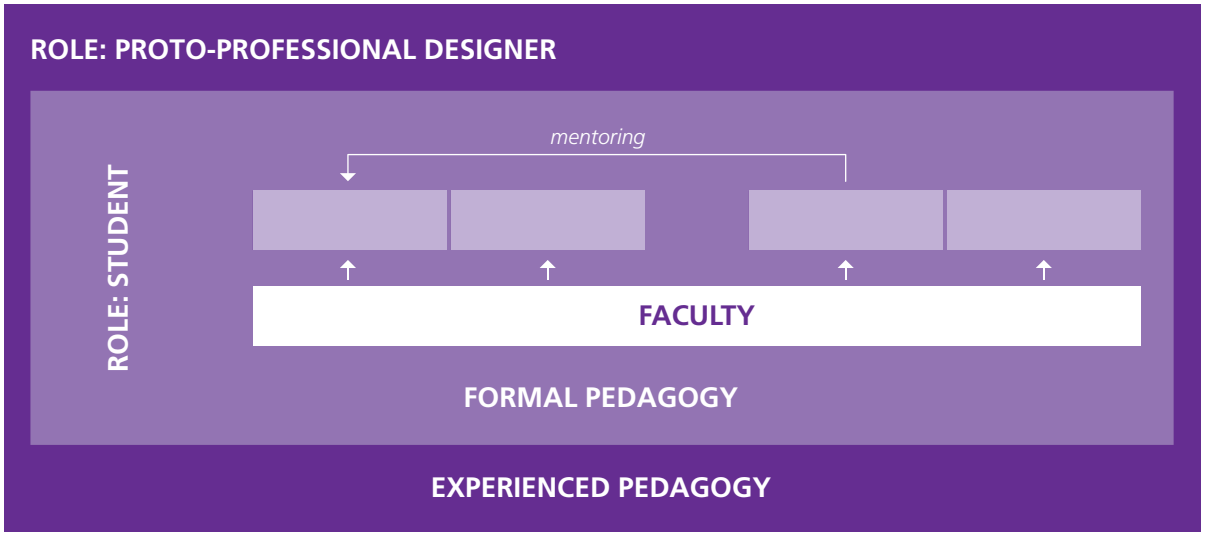


Figure 75. Detailed view of the formal and experienced pedagogy, locating potential student roles in the program.

Students Reproducing the Studio Culture

Students reproduced the studio culture that they worked within on an ongoing basis, using elements of the formal pedagogy as a baseline with which to experience the program, but also building on this pedagogy in ad hoc, student-led ways. Some of the main ways students encouraged the reproduction of student culture included: immersion in professional design activity through internships and professionally-oriented conferences; developing methods of informal

education to raise skill and tool knowledge across all students; and mentoring students and encouraging communication about design in the studio.

Through Immersion in Professional Design

Unlike the conferences and methods of dissemination common in the formal pedagogy—with papers drawn from formal venues like ACM literature and design challenges done for the CHI student design competition—students located venues that were perceived to be more appropriate for an aspiring professional designer. Students researched conferences and got suggestions from alumni through the research groups, all of which resulted in their attendance at mainline professional design conferences such as IXDA, SXSW, and Interactions. Students also used these conferences as a way to develop additional design projects, with submissions to TEI, Interactions, and the Microsoft Imagine Cup. Virtually none of these venues were rigorous in the ways that were appropriate for scholarship, and mirrored by professors in the department. But students saw a pragmatic value in attending professional design conferences that they did not find in the mainstream conferences like CHI encouraged by the program.

Through Active Upskilling and Informal Education

Students built out multiple avenues for discussing the development of skills and tool knowledge, often running directly parallel to the program requirements. During the first semester, students became known for certain areas of expertise—either in computer software, or more holistic disciplinary knowledge. This knowledge was then brought to bear on a recurring basis through informal conversations in the studio, the formation of project teams with varying levels of expertise, and semi-formal student-led events like Mad Skillz Club and design challenges at HCI/d Connect. The majority of knowledge sharing among students was oriented towards more general knowledge about design activity, focusing on tool specific knowledge (e.g., wireframing tools, photography or layout tools) that was not the focus of instruction in the formal pedagogy.

Through Mentoring

The mentoring structure, mentioned above, also encouraged the reproduction of a design sensibility among the students. Mentors reinforced norms of behavior in working with first year students in design teams, encouraging the propagation of appropriate norms of interaction in the studio (e.g., informal communication, overhearing, formative critique). These mentors were also mentored the previous year, and thus formed an unbroken line of students that engaged in design activities in a specific way; mentors were engaged in translating the formal pedagogy into informal norms of interaction in a more proto-professional space.

Professors Creating a Baseline Experience Through the Formal Pedagogy

Professors continually worked to update and evolve the HCI program, creating new courses and adapting old ones as needed to allow graduates to meet the challenges of professional design practice. These changes occurred primarily as a result of professor interactions with alumni of the program, or through research on practice that often included data collection with alumni. These linkages between professors and alumni not only informed the ongoing evolution of the program, but also validated the alumni's role and position in being able to provide relevant feedback.

Through Varied Approaches to Studio in the Classroom

This program enacted the concept of studio in two important, complementary ways. First, the curriculum allowed for enactment of studio pedagogy in a limited, yet highly varied, way in classroom instruction, with multiple classes taking on portions of the studio model. In the Fall 2013 semester, I observed: Mei's prototyping course, with a focus on a studio model of education, with little direct instruction and a substantial focus on making/crafting activities individually and in groups; ES's design theory course, where longer class sessions were often used for group collaboration, group critiques, desk crits, and other formative project activities; and Marty's rapid design course, where class sessions were used for team-to-team peer critique of projects. Interestingly, Marty's introductory design course taken by first year students featured the fewest

explicit studio elements, dominated by direct instruction, formal presentations, and summative critique. Second, the informal studio space took on much of the role of a traditional studio, but with classroom instruction and the formal presence of faculty largely absent. Students were left to shape their own studio culture, defining acceptable norms of interaction, and enacting portions of the formal pedagogy in ways that they determined to be appropriate. The formal pedagogy shaped this studio space through the kinds of projects that were assigned in required courses, the styles of collaboration that students were required to work within, and the methods and underlying theory that pervaded the curriculum, but ultimately, the studio culture adjacent to the classroom studios was constructed by and for students, as they took on a proto-professional designer role.

Through Adaptation Based on Alumni Feedback

Feedback from alumni working in professional practice informed the development and adaptation of courses within the formal pedagogy. David told students in his readings course early in the semester that "this class is here because a graduate of the program had never heard of affordances…so here you are; I'm sorry" (David, 09162013, I542). In addition, Marty allowed alumni of the program to write project briefs for the rapid design course he managed, injecting real world projects into the curriculum. In IDP, Marty also made significant changes over time, adding a semester long project focusing on wireframing when he heard from the field that students were not getting enough experience in this technique in the formal pedagogy. Mei also engaged with the alumni community, focusing more on including projects that she could see long-term benefit for in certain sectors of the professional design space—in emergent spaces such as tangible and ubiquitous computing.

Through Validation of Alumni Network

The alumni were validated as part of the development of the program pedagogy using many of the interactions mentioned above. But more importantly, perhaps, alumni *wanted* to be involved in the pedagogy; their legitimation as expert designers was formalized through

interactions in Marty's course, and their role in HCI/d Connect on a yearly basis supported recruiting of current students. This connection was made even more explicit in interactions through the student-created Facebook groups; professors occasionally responded to alumni posts, encouraging the connecting of alumni through portfolio critiques, collaborative discussion of emerging design tools, and sharing of design precedent.

Content Inference Fields

As demonstrated above, students interact in and experience the pedagogy in two different contexts: the first context defined by the academic community and characterized by scholarship and normative professor-student relations; and the second context defined by professional practice, or a projection of the practice community in a proto-professional role, characterized by designerly identity and design activity, structured within designer-client relations or designer-professional community relations. I propose that these two contexts form distinct *content inference fields*, characterized by different locutionary and illocutionary content and related structures. While I do not attempt to fully map each of these fields in this section, I do wish to highlight some of the features of these fields (Table 16), and how students and professors navigate between them and communicate through them. In addition, I draw some connections between the language of Shaffer (2003) and Brandt et al. (2013) and this terminology, with the intention of providing a preliminary framework for future work in exploring and documenting this field phenomenon in a design education context.

Table 16. *Comparison of Education and Practice Fields by Structural Features*

	Education/Scholarly Field	Practice Field
Roles	Professor Student Mentor/AI PhD Student/Scholar Practitioner/Alumni Scholar/Researcher	Student (acting as an early practitioner) Practitioner/Alumnae Scholar/Researcher
Typifications	Classroom instruction	Critique as designerly communication

	Mentoring Academic advising Critique as evaluation Design activity/collaboration	Upskilling/informal education Design activity/collaboration
Norms	• Professors should present a reasonable argument to be respected / acknowledged. • Students can have better ideas than professors. • Students should defer to/respect professors.	• Everyone should present a reasonable argument to be respected / acknowledged. • Students should defer to / respect practitioners with more experience than they have.
Formal Rules	• Professors grant you entrance into the academic program. • Professors assign you a grade for your work/performance. • Professors decide whether or not you get to graduate / receive a degree.	• Student interactions with practitioners can affect their ability to get a job.

Student Interaction Within Fields

As demonstrated in chapter seven, students frequently developed systems, tools, and norms outside of the formal pedagogy, with the intent of learning how to enact a proto-professional designer role. The field of proto-professional emerges early in the first semester as students interact with mentors, who also see themselves as part of a projected professional community of designers. While professors interact with the professional field to some degree, it is generally as a researcher and professor, not as a practicing design professional. This dramatically different way of interacting with fields on the part of students and professors creates a distance—both in illocutionary structures, and in how these illocutionary structures shape the communicative acts that can occur (and what meaning is conveyed). In the studio interactions I observed, students most frequently took on roles within the proto-professional field, occasionally bringing the assumptions of this field into the classroom, which was dominated by the academic field, and the normative assumptions that are included in that field. Professors reacted to this employment of a proto-professional field with varying approaches; some, like Marty and ES seemed to create space in their pedagogy for change based on the students' proto-professional field in a direct way, asking them to share their

professional experiences in class (e.g., internships, previous business experience), while others operated more strictly within the academic field.

The crossing between fields seemed to be relatively fluid for most students—especially those who most readily adopted the proto-professional field. Other students, often the ones least frequently seen in the studio, only seemed to accept the academic field as valid, ignoring or seemingly blind to the presence of the proto-professional field. Professors seemed aware of both fields to some degree, but with varying implications for their scholarship and pedagogical implementation.

Linking Vocabulary

The professional community of practice, while linked to the academic community of practice and studio bridge in some absolute sense in Brandt et al.'s (2013) rendering, appears to be more disjointed than that initial model suggests. The concept of fields—with each field as a relatively impermeable structure—brings with it a set of defined roles, norms, and typifications. While the Brandt et al. model of overlapping communities of practice represents a potential for interaction between practice and academic fields, it does not take into account the conflict that these two overlapping fields represents. Using the language of fields, we can look more carefully into the locutionary and illocutionary structures of appropriate communicative acts in each field, and then see how they combine and conflict in a design studio context. For instance, a student acting within the proto-professional role and related professional field may reject the evaluation structures of the classroom as inauthentic; in return, the student may not be rejecting evaluation through critique, but rather expanding the notion of being critical to all of their designerly communication. A professor unaware of this shift of field on the part of the student may conclude, within the academic field, that the student is rejecting the idea of evaluation entirely. Similar conflicts may occur along the typifications addressed in Table 16; for the majority of typifications

where no direct equivalent is available across both fields, the potential for conflict and tension may exist.

The system relations described above elucidate some of these potential conflicts, highlighting the differences in norms, roles, and typifications between the academic and proto-professional fields. Additional work could be done to further describe the interactions between the professional and proto-professional fields, although the illocutionary structures between these two fields are likely much more closely linked and permeable than the proto-professional and academic fields. During data collection in the Summer of 2013, there were strong interactions between this professional field and proto-professional role as students took internships and professional design positions; these professional positions promoted a co-construction of identity between the individual student or early professional and their place of work, mediated by previous academic experiences of design and the student's philosophy of design (Gray, 2014).

Many of these same issues can be seen when decomposing Shaffer's (2003) theoretical model of the design studio to take into account the felt student experience. When that model is separated out to create a designed and experienced dimension, in addition to a classroom and student-created studio, many of these same potential conflicts of illocutionary structures are foregrounded once again. In the process of creating and reproducing the structures of the proto-professional community, many of the distinctives of the academic community are thematized by students and evaluated on an epistemological level. Students are encouraged by the formal pedagogy to discover their design philosophy, and in doing so, many of the baseline epistemological values of the program—of human-centeredness, teamwork, knowledge of the user—become foregrounded as concepts in the academic field, and then embedded in a proto-professional context, situated in design activity enacted by the student/proto-professional.

Each of these theoretical models of the studio will be discussed in more detail below, including opportunities to extend the models to represent more fully this field phenomenon.

Ultimately, the recognition of the agency of the individual learner in enacting and constructing their own experience leads to a fuller explication of how these fields relate in the educational process. The language of content inference fields, while not fully developed here, provides a jumping-off point to theorize the learner, and the illocutionary structures in which the learner develops skills and a sense of designerly identity—in academia, and in relation to professional practice.

Discussion

In this section, I will synthesize the system relations of this specific design program with a broader view of how students and professors interact within the academic and practice fields, reinterpreting and broadening the theoretical constructs of the studio and studio pedagogy set out by Brandt et al. (2013) and Shaffer (2003). Through this discussion, I will also explore opportunities for applying the concept of content inference fields to foreground the student experience of the formal pedagogy and the students' creation of a proto-professional field for development of their designerly identity.

Location and Evolution of Identity

Students in this study rapidly shifted from identifying as "students" in an academic field to identifying as designers, in a proto-professional sense. They choose this positioning because of their personal commitment to both *be* and *become* a designer (Nelson & Stolterman, 2012) in the broader HCI community, a choice mediated by the individual student's agency outside of the academic context. This choice to identify as a designer was not made because the pedagogy coerced them to take on this identity, but rather because the pedagogy scaffolded the decision to take on a designerly identity, providing the necessary concepts and metacognitive space to build this identity. Two of the faculty talked directly about developing a designerly identity in a variety of ways, through topics that included: design philosophy, finding *your* core, mapping out your own "whole game," articulating your "this I believe." These appeared to be scaffolds for students to begin their own internal conversation about their identity—both who they currently are, and who

they want to become. This ongoing quest for greater design expertise was expanded on by the ten HCI/d students who participated in the summer study on competence (Gray, 2014) used as a secondary data source in this dissertation study, as they actively had to address how they currently "ranked", and how they intended to improve their competence as a designer over time.

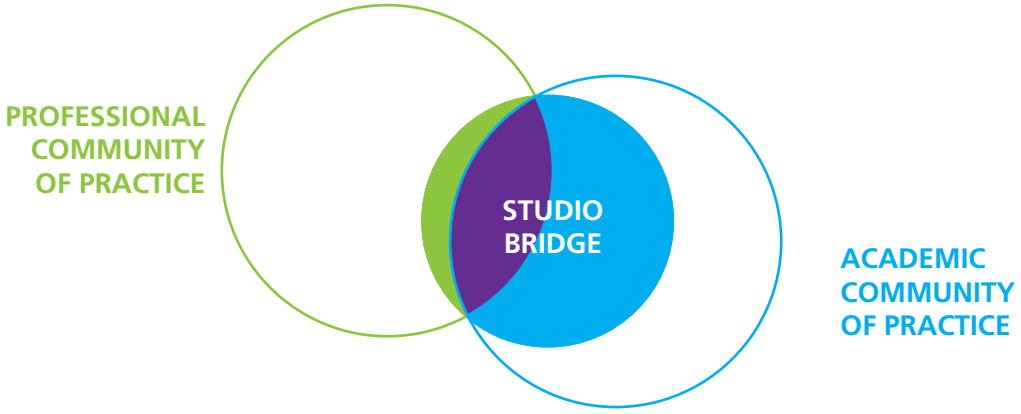
As the students located and altered their identity, there seemed to be several systemic forces or structures at work. These included: the cohort model, the mentoring approach to instruction, the active presence of individual identity construction (and the tools to do this construction work), the presence of an markedly active alumni network, and a strong internal commitment on the part of students to expand their skills/competence outside of the classroom. Without any one of these elements of the overall system, much of the identity of the student that comes out of this educational program would presumably be substantively altered, although additional research would be needed to definitely identify the relevant causal relationships.

Professors are largely "stuck" in only the academic space, with their productivity measured in terms of research output rather than real-world design. Students recognized this quickly, both through their interactions with alumni on Facebook, and in discussions with the second years. Mentors served as leaders in a cohort system that used academic status as a primary identifying characteristic. These same mentors reiterated lessons from alumni and their own experiences in professional internship settings, and they promoted a curated view of the overall curriculum with an eye towards practice. Additional informal learning opportunities naturally sprung from interactions like these, where everyone has something to teach and everyone has something to learn; mainstays of student life like HCI/d Connect and Mad Skillz Club were created at some point in the past by students, and had been reproduced over time in varying ways, but with the same goal in mind. On the personal identity level, multiple tools were made available for students to reflect on their own self, and the presence of mentors and alumni provided a multiplicity of templates for who these students might be. It is through this discursive and dialectical identity

construction—aided by the formal curriculum in establishing habits of reflection and a baseline of vocabulary—that students created spaces to actively enact/perform their identities, shaping others' identities while they themselves were shaped.

Relationship of Pedagogy to Practice Community

This element of agency and student-directedness within studio pedagogy is never addressed explicitly in the existing literature. The vision of the "studio bridge" (Brandt et al., 2013) addresses the issue of communities of practice in relation to learning and professional practice, but privileges the academic version of events in a hegemonic way. The communities of practice, which I propose could be expanded through a discussion of these communities as *content inference fields*, overlap in the way the extant literature might suggest they do, reflecting how professors designed or imagined them to overlap. This assumption of the location of the studio bridge (Figure 76, top) assumes that the professors are the sole or primary constructors of the academic field; but this construction does not address the student's construction of their own field, which in this case, is much more substantively oriented in practice than in the academic orientation assumed by the professors (Figure 76, bottom).



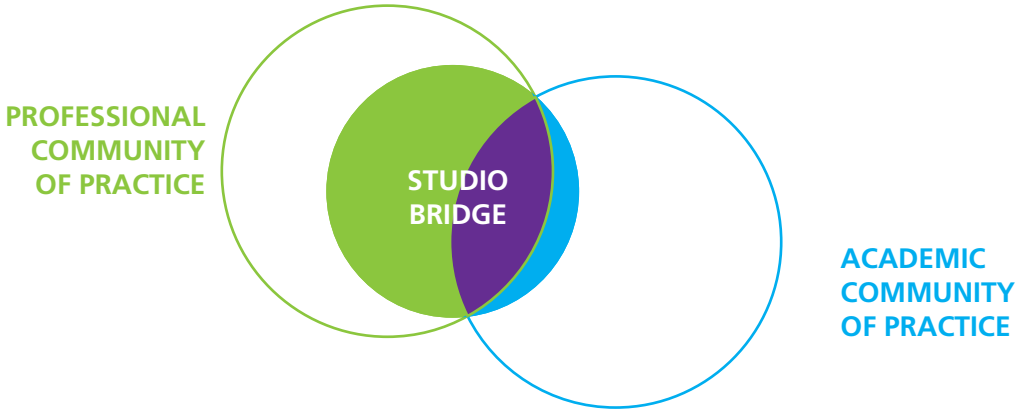


Figure 76. Designed studio bridge oriented towards the academic community (top); and the studio bridge experienced and constructed by students oriented towards professional practice (bottom).

This construction of fields is present even when students are only given the tools to succeed in the academic discourse—through traditional modes of scholarship, conferences that promote scholarly inquiry, and a restricted set of tools. Students quickly move outside of this constructed academic field and create their own standards of rigor, sets of tools, and places for professional conversations to take place. With this field phenomenon taken into account, the studio can be seen in different ways depending on which subject position is taken (Figure 77). The studio space, as envisioned by professors or the formal pedagogy, might be described as an academic proving ground, with design activity as a means for students to learn to be an experienced designer, as defined by the academic discourse. Students operating in the proto-professional field may imagine the studio—in both physical and digital forms—as a place to practice design in a broader sense, as a means to enact their designerly identity. This understanding is not altogether different from what a student might report in a studio culture within a traditional design discipline, but because this program operated under a substantively different implementation of studio—both in classroom and non-classroom settings—this finding is significant.

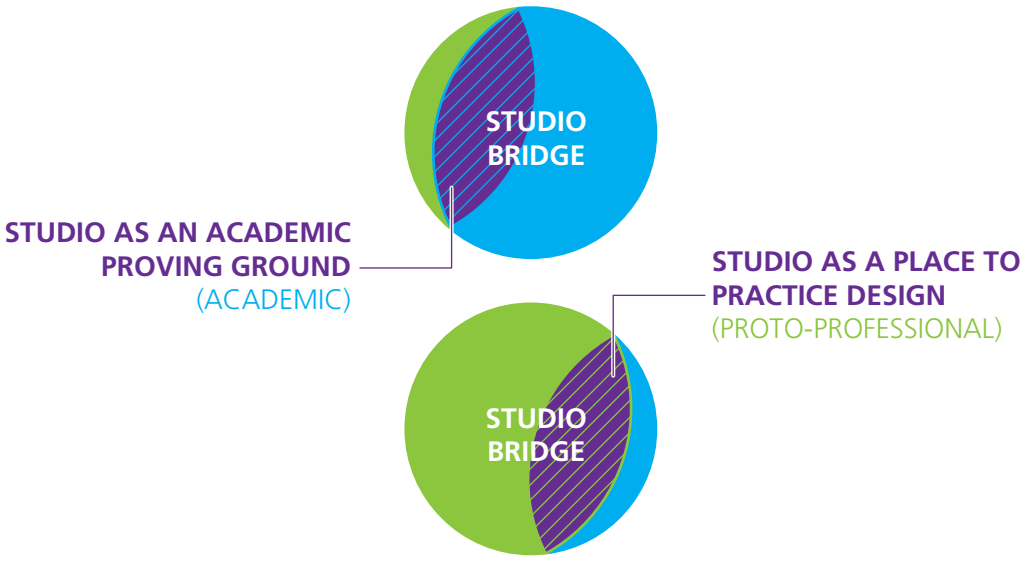


Figure 77. Comparison of an academically-foregrounded (top) and a professionally-foregrounded (bottom) view of the studio bridge.

The specific relations between content inference fields, including the limits of each field, the mechanisms for up-leveling and down-leveling, and how the fields intersect with illocutionary structures have not yet been fully explored. Any design activity, seen as having a distinct and coherent locutionary content, regardless of illocutionary setting, might be thought of as being contained within a single content inference field. For instance, design activity as a student might be seen as roughly equivalent to design as a practitioner, albeit with different constraints and pressures. The definition of what might be constituted within the design content inference field becomes more difficult when taking into account the complexity of the research community. I would posit that certain forms of design that are often lumped together, ontologically and epistemologically, in the research community actually represent a different content inference field than design as presented above. The shift in the last decade towards design as a form of scientific knowledge production can be seen within the research community, operationalized through methods such as *design-based research* and *research through design*. I posit that this pursuit of

design, first and foremost as a method by which one might create propositional knowledge, *is* distinguishable from design activity as it is traditionally understand as intentional change in the context of creative production.

In this study, these two understandings of design are frequently blended and synthesized, owing to the tier one research status of the university in which the program was situated. Faculty members are hired and tenured on the basis of their research production, not their creative production. And in this sense, some of the faculty—especially Mei, David, and Dwight—employ their understanding of design primarily within the academic mode, in a content inference field that is circumscribed by the scientifically-focused outputs of design rather than design activity itself. These faculty members see the ways in which this view of design as a means of scientific knowledge production is related to design activity as a distinct way of knowing (Cross, 2001), and frequently synthesize this understanding in their academic writing. But while these professors do not intentionally conflate design and design as research, practically speaking, I have seen that the conflated view is what comes across to the students. Meanwhile, Marty and ES communicate almost completely in the design field, where the content inference field of design taught in the classroom has a rough equivalency to that of practice. While the content inference field in this case is characteristic of design rather than academia, there exist some areas of intentional or unintentional repression, related to the differences in the illocutionary settings of academic and practice; for instance, the realities of doing design in a classroom setting rather than a professional setting may foreground certain qualities of the design field, and background others.

Additional analysis will be needed to understand more completely the relation of these two fields, including how the faculty and students repeatedly claim and reproduce these fields through communicative acts. In particular, identification of the awareness faculty and students have of these fields and how they are able to transcend these fields through this awareness would reveal additional information about the interactions that each field allows to be foregrounded, and how

the qualities of these interactions can be up-leveled or down-leveled in relation to a given illocutionary setting or discourse.

Construction of Experience

Through the students' construction of an individual identity in relation to the academic program and to professional practice, we can also discuss the role of the felt *aesthetic experience* (Parrish, 2005; Parrish, Wilson & Dunlap, 2011) from an instructional design perspective, which contains elements of learning. I did not see an experience circumscribed or even primarily defined by the educational program, but rather a set of individual experiences (e.g., sketching the "whole game," writing your design philosophy, working in teams) that encouraged the construction of an aesthetic experience—integrating one's lived experience, specific educational opportunities, and future professional goals. In this way, the constructed experience was informed by the educational imperative, but the enacted or felt experience was much larger than any designed curricular experience. In fact, students frequently used experiences outside of the formal curriculum as a "stake in the ground" to guide their own sense of what the experience meant, in some cases rejecting the thrust of the formal program, and in others, augmenting it or contextualizing it through the lens of professional practice. It is precisely this flexibility in the construction and enactment of experience that appeared so easy for students to do once they learned how—while respecting and being able to thematize both sides. But the role switching that appeared easy for students during the Spring 2013 semester proved to be quite traumatic and stressful in the Fall 2013 semester, when those behaviors were still being learned—through growing tensions between what they were learning in the formal curriculum, and how they were being encouraged to interact with other students and design professionals in other contexts. For faculty, however, position-taking on the part of the student or projected professional became much more difficult, because their locus of identity was most tightly bound to the constructed experience, and their scholarly understanding of how it is or should be enacted. While faculty members in a professor of practice

position in a teaching university may not experience this disconnect from the realities of professional practice, the faculty members in this program were hired and tenured because of their ability to perform research in the academic HCI community, not because of their professional credentials as designers. These faculty members commonly used examples found in academic HCI, including relevant standards of rigor, definitions, and ways of producing knowledge; these were presented in sharp contrast to the resources that second year students and alumni most commonly used.

Layers of the Studio

Shaffer's (2003) theoretical model of the studio—comprised of surface, pedagogical, and epistemological layers—foregrounds the physicality and materiality of the studio and the pedagogy that takes place within that context. Each level, as in the Brandt et al. model (2013), privileges the curricular and professor voices, ignoring or deemphasizing the impact of these structures on the felt student experience. This is similar to the disjuncture between intention and experience outlined above in regard to the practice community, where tensions arose in cases where students were taking on a different role than the faculty expected. Likewise, each "layer" of structures[3] in the Shaffer (2003) model might productively be seen from not only a professor standpoint, but also from the perspective of the student, as tentatively outlined for this program in Table 17. A productive tension also exists between the varying expectations and perspectives of the faculty in the program; through the very existence of the two discourses mapped in chapter five between Marty and David, students were faced with a choice of which perspective to adopt. And in most cases, students adopted neither perspective as a monolithic unit, but rather integrated both perspectives into their overall understanding of their evolving designerly identity and philosophy. These tensions between faculty present a less consistent and clear message than might be indicated in the system-level view offered by Shaffer (2003); but it is in the dismantling of the structures and

[3] I am using the language of Shaffer (2003) to discuss the three layers of his theorization of the studio as "structures." However, the use of structures in this way is not directly parallel to the larger concepts of structure and structuration used elsewhere in this study in a more typical critical or structuralist framing.

locating differences of opinion across multiple subject positions that many productive insights may be found.

Table 17. *Comparison of Shaffer's (2003) Structures of the Studio By Type and Role*

	Non-Classroom Studio as Designed	Non-Classroom Studio as Experienced by Student	Classroom Studio as Experienced by Student
Duration / Permanence	Semi-permanent (by faculty involvement)	Semi-permanent (by cohort or year)	Transient (as enacted by a professor)
Surface Structures	• Whiteboard surfaces • Work tables • Collaboration tables	• Whiteboard surfaces • Work tables • Collaboration tables Facebook groups • Subject matter experts	• Whiteboard surfaces • Work tables • (Making/building supplies)
Pedagogical Structures	None explicitly defined; no courses offered in the space	• Mad Skillz Club • HCI/d Connect • Professional blogs/sites • Professional conferences • Wireframing, creative, and collaborative tools (wide range) • Formative and summative critique • Designerly talk	• Lecture • Learning through making • Presentation and critique • Academic readings • Academic conferences • Wireframing and creative tools (limited selection) • Summative critique
Epistemological Structures	• Collaboration • Team-based designing • Ephemeral representation of design activity	• Professional competence • Group > Individual • Everyone has something to teach and learn	• Individual design philosophy • Grounding in HCI theory

Using Shaffer's (2003) model as a starting point, I propose extending the theorization of the studio to its designed and experienced manifestations as accessible through student and professor subject positions; and in this case, also exploring the role of classroom-based studio instruction and the non-classroom studio space used and generally controlled by students. Additional research, mapping the interleaving of designed (what was *intended* to be experienced) and experienced (what was *actually* experienced) features between professor and student subject positions and the interfacing of classroom and non-classroom studio spaces, is needed to fully extend this theoretical

model to take into account the field phenomena projected in the earlier discussion. It is probable that epistemological structures experienced in the classroom are thematized and foregrounded through student interactions, then imbued into pedagogical structures constructed by students, for students. For instance, the students' need for a heightened sense of visual literacy was exposed through deficiencies in courses early in the curriculum. When students realized their need for additional visual literacy skills, they reconciled this deficiency outside of the classroom through student-to-student interactions. Students with professional graphic design knowledge were sought out in a variety of contexts, including a series of Mad Skillz Club events on typography, Adobe InDesign, and Adobe Photoshop. Similarly, a focus on developing a personal design philosophy in ES and Marty's courses informed the student's development of professional portfolio sites, which was then exposed during the student-led HCI/d Connect recruiting event. This are just two cases in which students appropriated formal pedagogical and epistemological elements from the academic field, reconstructing them to suit their own purposes in the proto-professional field.

Phase Five: The Social System

Any efforts to link the interactions between these students and the formal pedagogy are necessarily limited to the individual program level. However, results from this study, taken along with the prevailing theoretical models of the studio and professional design education, are highly suggestive of how students relate and interact simultaneously to their academic program of study and their future professional design community. In traditional design disciplines, this separation has not been as substantial; professors in these design programs (e.g., visual design, industrial design, architectural design) often continue to practice in their specific design discipline, either in a commercial sense, or in the production of design artifacts in order to gain tenure. Students are absorbed into a culture that is oriented towards professional practice, with many academic structures similarly linked to professional practice. These traditional design disciplines might be described in Brandt et al.'s (2013) diagram as ideally oriented equally toward the professional

community of practice and academic community of practice. But it is important to note that traditional design fields, such as industrial design, which is addressed in the original diagram, have an academic community whose character is quite similar to professional practice, including tenure requirements for faculty that are often more indicative of design capability than research expertise.

However, these same assumptions of professors being trained and enculturated into a specific design discipline, perpetuated through an ongoing practice of design, cannot be made in more emergent design disciplines. These emergent disciplines, which could often be described as dominated by "scientised" views of design in Nigel Cross's (2001) language, are subject to different rules and methods of operation as compared to their traditional design discipline counterparts. The tenure system in these emergent disciplines is still based firmly in traditional forms of scholarship—not the creation of designed artifacts—and this academic thrust is felt by professors in these fields, particularly in research-intensive universities, like the university where this study was carried out. Additionally, many of these professors have not been formally trained as designers within the discipline where they teach—none of the primary professors in the program under study received their training in HCI or design—thus, there is less perpetuation of a known and defined design culture, as would be typical in traditional design disciplines.

The lack of grounding in traditional design in non-traditional or emergent design disciplines surfaces the issue of shifting identities from scientific fields with traditional academic structures to more designerly ways of thinking, knowing, and acting; this is a challenge not only for professors, but also for students trained in a scientific mode. The shift of identity—from the scientific to design tradition—is a violent, and often difficult process to experience as a student (Gray, 2013c; Siegel & Stolterman, 2008), and possibly even more so to direct as a professor. The students in this study felt a strong connection to their professional community, even as the professors perpetuated more scholarly forms of engagement; the conferences attended, modes and media for expression, and creative or professional tools all differed substantially between these two groups by the end of the

two-year program. As professional design education rises in prominence in these new, emergent disciplines (Boling & Smith, 2014; Faiola, 2007), and as traditional design disciplines gradually move toward a more scientific mode of scholarship (Frayling, 1993; Zimmerman, Forlizzi, & Evenson, 2007)—through the proliferation of multi-disciplinary design programs and a shift to awarding PhDs in design (Durling, 2002; Margolin, 2010)—these issues of professional versus academic communities will continue surface. Taking into account the larger forces at work in the creative community, and training individuals for these professions, while also justifying these decisions within a traditional, research-dominated academic framing will likely become increasingly challenging. As the creative class increases, we must confront the very present reality of shifting understandings of what education is intended for in a design context, and the responsibilities of students, professors, and the larger professional field for these outcomes.

CHAPTER 9: Conclusion

In this dissertation study, I have documented informal interactions outside of the formal pedagogy, and engaged in reconstructive analysis to locate the system relations and structures that reproduce these interactions over time. This understanding of informal interactions and features of the underlying system informs a preliminary mapping of how these expressive acts link to the experienced surface, pedagogical, and epistemological structures of the studio (Shaffer, 2003) and how students interact fluidly between academic and professional fields (Brandt et al., 2013). To summarize the findings and impact of this study, I bring the conversation back from the analysis and discussion of specific data to the broader research questions I set out to answer. These first sections of the conclusion will also serve as a brief description of the findings relevant to each research question, leading to the implications of this study, related limitations, and potential avenues for future research.

Summary of Research Questions and Findings

In this section, I review the research questions I set out in chapter one and contextualize the findings that relate to each question. Themes from the narrative chapters (chapters five and six) and deeper analysis of pivotal events in chapter seven are used to support my assertions, which are formalized in a discussion of system structures and relations in chapter eight.

What kinds of informal interactions are occurring outside of the formal pedagogy between students (primarily in the physical studio space)?

Informal interactions outside of the formal pedagogy are rich and varied. While many of these interactions were shaped in some way by the educational superstructure, students quickly learned to create and extend the studio on their own terms, through informal educational ventures like Mad Skillz Club; alumni connections through Facebook groups and HCI/d Connect; mentoring, collaboration, and critique; making activities; and participation in professional conferences. While there was a substantial amount of informal critique between students, especially during the Spring

2013 semester, a greater portion of interaction was taken up in *designerly talk* (Gray & Howard, 2014), where students engaged in a higher level of discourse than everyday social conversation around topics that have relevance to design, while not orienting their conversation toward a specific project in a directional or evaluative manner, as in traditional critique.

How do these informal interactions outside of the formal pedagogy relate to existing knowledge about critique as a signature type of studio interaction?

As discussed in a fuller analysis of an encounter between two students surrounding a design project in the previous chapter, informal critique took on a different character from what the literature currently suggests in relation to formal or classroom-based critique. Many of the statements did not fit neatly into the largely evaluative framing suggested through the current structures of critique; there was a loose connection between talk about design and the application of that conversation to a given project, with more focus on "trying out" professional modes of communication, often in a critical stance, than on evaluating a project in a formal sense, as they engaged in during a class session. This suggests a need to broaden our understanding of what critique and talk in a critical mode looks like in a more social than classroom framing, especially as students orient this designerly talk primarily towards a proto-professional field.

What structures exist and are propagated by students, and how do these structures relate to the assumed structures of the formal pedagogy?

A number of structures identified in the system relations section of the previous chapter have a substantive basis in student interactions, many of which are directly enabled by student-to-student communication about design in a distinct social context, with student-defined norms and priorities. While many of these structures—mentoring and the cohort model in particular—emerge from the formal pedagogy, the students quickly established the parameters of these structures, defining appropriate norms, reproducing norms from previous years, or creating new ones. All of these norms were enacted and reproduced in a variety of roles and typifications, many of which

were not directly indicated by the formal pedagogy, and were more closely connected with the proto-professional field than the academic field. Beyond the formal structures, students created and sustained several important structures on their own, frequently reproducing structures from previous years, but also shaping and rethinking these structures in the current cohort environment. These structures and system relations were claimed and reproduced through two distinct content inference fields, with students effectively living in the two worlds of academia and professional design practice, situating and contexualizing their interactions pointing towards a proto-professional role and the professional design community. Structures and relations such as informal education, internships, and community are "owned" by students in some sense, and it is their responsibility to determine how these structures affect their own experience on an ongoing basis. All of these elements are highly dependent on the construction of the cohort, the leaders within a given cohort, and the legitimation of their activities by professors and others that are considered to have authority.

Implications

This study cuts across two primary areas of literature, both of which have developed largely separate from each other: 1) instructional design and technology; and 2) design pedagogy and studio education. The analysis of data in this study has provided me with a basis to consider implications about the nature of the student experience within a design pedagogy, extending the limited amount of work in this space (Dutton, 1991; Willenbrock, 1991). These implications are powerful, not only for the process and constraints of designing for experience in an instructional design framing, but also in a recognition of how the studio mode may operate when released from its historic role as defined in traditional design disciplines and redefined through various implementations in emergent design disciplines. Before addressing implications in relation to instructional design and technology and teaching in the studio mode, I wish to call out three dominant themes that cut across both sets of literature: 1) the student experience of the program

extended far beyond the formal curriculum, and even the conception of a "studio" space, transcending the classroom experience, and suggesting that we should broaden our focus when designing for such immersive pedagogical experiences; 2) the studio is substantially larger and more complex than our current theorizations (e.g., Brandt et al, 2013; Shaffer, 2003), indicating that we need better approaches to explain the systemic forces at work in a complex educational system, particularly in representing the learner in relation to the formal pedagogy; and 3) students oriented their identity towards professional practice even when the formal pedagogy did not, implying the need for a stronger connection between academic and practice communities, particularly in professional disciplines.

For Instructional Design Theory

The instructional design community has historically been interested in discussing the design of instruction in relatively deterministic ways, representing design as a systematic process with a linear thrust, focused on problem-solving, and reified in models (Smith & Boling, 2009; Smith, 2008). In confronting a live, active pedagogy like the one represented in this study, this view of a static, designed pedagogy fails to explain many of the interactions that occurred. While some scholars have made more recent attempts to address the active construction of experience in Deweyan terms (Parrish, 2005, 2008; Parrish, Wilson, & Dunlap, 2011), these efforts have largely been oriented towards modifying the practices of instructional designers in a principal way (Parrish, 2009, 2014). As such, these efforts have not yet given scholars the tools to deconstruct experiences, both in their designed form, and in how they are experienced by learners with agency and a sophisticated sense of identity.

These concerns of the learner and the context they construct and experience are not encompassed within principles, process, procedures, or concepts (Reigeluth, 1999), and are not bound up wholly in traditional conceptions of learning objectives, but nevertheless represent critical parts of the instructional design that we have not historically focused on, to our detriment. Parrish

(2005, 2014) has addressed the failure of traditional instructional design language to encompass the aesthetic dimensions of a learning experience, encouraging a shift of focus from learning objectives to learning activities—from a granular matching of objectives and content to an understanding of how the activities of learning are experienced. But this study indicates an even more substantial shift; to more fully account for the lived experience of interacting and living within a designed educational environment—both in a physical and curricular sense—designers must increase the nuance with which they envision learners and the roles they will take on, and take care to understand how the formal and informal educational experiences may intersect or diverge over time in a systemic, socially-bound way.

This study provides a first step towards this goal, building on early theorizations of the studio by Brandt et al. (2013) and Shaffer (2003) within this experiential mode—not just privileging a curriculum-centric professor subject position, but also including the felt experience of the learner. I address three main implications for these theorizations in the following sections, which are relevant for the practice and understanding of instructional design: 1) a re-imagination of student roles and capabilities made possible by viewing learner roles as non-deterministic, 2) a new framing of how students in professional programs build and enact their identity, projecting their future professional role in relation to academic and professional communities of practice, and 3) how instructional designers and implementers of pedagogy (e.g., professors) can legitimate student roles in powerful ways that encourage the building of a professional identity, not just subsuming their efforts within the traditional student role. These implications are relevant both for the teaching of instructional design in the studio mode and more broadly for teaching in the studio mode, regardless of discipline.

Non-Deterministic Student Roles

Now I speak as an instructional designer to other instructional designers. We cannot assume that the roles we project for students will be the roles that they inhabit. In this program, I

frequently observed students taking on proto-professional roles that they had constructed for themselves, often building on a composite picture of what a professional designer might look like—from alumni interactions in Facebook groups, classroom instruction, academic readings, and professional design experience through an internship. These sorts of roles might be predicted, to some degree, from a curriculum or instructional design perspective, if a deep enough understanding of who the learner might be exists. But this objectivation of roles requires an instructional designer to accept a softer determinism—where learners are not restricted to the roles we create for them, and do not always experience the curriculum in the way we might envision (Parrish, 2014)—than is currently indicated by understandings of learner analysis in the instructional design literature.

Rather than students inhabiting a static learner role, both first and second year students in this study acted in a variety of roles in a remarkably fluid manner. In many cases, they rejected the student role for that of a proto-professional as they constructed their designerly identity—living effectively in the academic field within a student role, but centering their designerly identity within the field of professional practice in a proto-professional role. Most students readily took on a designerly identity during the first year of the program, with their identity formation around *being* and *becoming* a designer often preceding their actual expertise as a designer. While by the end of the program, most students had reached a level of expertise indicated by the third level of the Dreyfus model—"competent"—those same students had often already assumed an equivalent set of identity claims to this level of expertise by the middle of their first year, with skill acquisition lagging behind their designerly identity. The assumed determinism of roles students should play on the part of faculty resulted in some tension during portions of the planned curriculum, where some professors ascribed or assumed a learner role. The faculty assumption that students would play a student role was to be expected, since faculty were the gatekeepers for grading and evaluation purposes; but this assumed student role did not account for interactions where students were

taking on a proto-professional role, judging themselves and their design work by a projected set of professional standards, rather than the evaluation structures of the classroom. For instance, in Mei's class, some second year students became frustrated when the associate instructor, a PhD student in the HCI/d program, assumed their probing questions regarding an assignment in class were motivated by laziness, rather than the students' desire to understand how this project work could be more strongly related to their future practice.

The proto-professional role these students took on—in relation to their future professional practice, using the advice of second years and alumni of the program—was substantively informed by the history of the formal program. At the time this study took place, the program had been in place for over a decade, and was, at its conception, a pioneering design-focused HCI program. The ecology constructed and sustained by faculty in the program produced the critical mass of alumni that was in place to inform the generations of students I observed. Similarly, the physical spaces available to these cohorts of students had been justified and acquired through the growing enrollment and reputation of the program over time. Understanding of the ecology of learning in a situated sense is also a critical insight for instructional designers, who have historically not had the tools or methods to take into account the temporal and contextual dimensions of learning experience. A fuller accounting for the ecology of learning allows instructional designers to more directly relate learning goals for students to the larger educational and professional systems in which learning will take place, taking into account the unique logistical arrangements of academic programs, and the relationship of the academic program to the larger professional space.

Projected Community of Practice

There seems to be a strong teleological shift on the part of students while completing a professional academic program from an academically focused student role to one that is focused in professional practice. This seems to be especially true in professional disciplines of design like HCI,

where students orient to their future position in that professional discipline, rather than to the academic manifestation of that discipline.

Students in this study were relatively savvy in understanding what elements of the learning experience had pragmatic value, and actively explored what these learning experiences meant in terms of their future professional life. Especially in tightly coupled communities or cohorts, like I found in this study, alumni that are successful seem to serve as a stronger motivation and source of professional knowledge than the program faculty, no matter how expert and well regarded the faculty might be in an academic context. Starting in the first semester, students began to reconcile their ambitions and selection of tools around professional standards, guided somewhat by standards from classroom experiences, but quickly surpassing that and treating it as a baseline. Faculty grew to assume this baseline as well, often assuming that students could learn new technological tools without explicit instruction, or that students could effectively learn from each other and share their specialized knowledge in computer science, graphic design, or other fields in which students brought expertise. In creating this proto-professional community of practice, students learned to rely on each other for informal learning and upskilling, both through established mechanisms like Mad Skillz Club and more informal critique and designerly talk surrounding project work.

From a critical pedagogy perspective, we might consider the implications of these informal learning communities, especially relating to the students' desire for specific kinds of skill acquisition. While the skills they would need were hinted at in the formal classroom experience, students led the process of deconstructing the hidden curriculum they were being taught, comparing it to their understanding of professional practice, and then prioritizing certain types of learning to improve their professional standing. In this way, the students explicitly removed themselves from the modified *atelier* model practiced in this program in important ways, drawing on other forms of instruction outside of the formal educational experience, and interrogating what they were learning

in relation to professional practice. Other more explicit forms of immanent critique or *conscientization* (Freire, 2000) might be considered in this framing to allow students to further explore their rationale for building learning spaces outside of the curriculum, including their perceived structural relationship to the formal pedagogy, and how they converge with or diverge from the hidden curriculum of that pedagogy.

As referenced in more detail in chapter eight, the relationship of the professional world to the academic space foregrounded key issues of designerly identity, including appropriate relationships of the student to future practice, and the responsibilities or sense of obligation on the part of alumni for the ongoing success of the program they graduated from. Instructional designers engage with a significantly larger social system when designing for professional higher education programs; they must not only account for the core learning goals in an educational framing, but also the socialization of these skills and knowledge in the space in which they will be applied. Accounting for the immediate, academically-bound social system, the social system of professional practice, and the relationships between these two systems are not currently addressed at a sufficient level through traditional instructional design methods such as "context analysis." This traditional ID understanding of context is relatively static in nature, not accounting for situational variation in either the learning context or temporal dimension of learning experience, failing to directly account for the hidden curriculum and its implications for the learning experience at large. Addressing the social context of learning is a substantial challenge in a rapidly changing field such as HCI, but must be taken on by the instructional designer to ensure the present and future success and reputation of the program.

Legitimation of Informal Learning Communities

Instead of assuming that the instructional design must prescribe all learning activities and opportunities in a uni-directional way, there must be an attempt to investigate the construction of experience from the student perspective, and legitimate student activities where they intersect with

the overall learning outcomes that professors target through the formal curriculum. While more recent scholarship on the qualities of aesthetic experience has foregrounded the relationship of a learner to designed activities (e.g., Parrish, 2014), the focus has still been primarily on designing activities for experience, not in addressing how these experiences are enacted and encountered by learners. In the Fall 2013 semester, professors relied on several defined activities to produce a desired learning experience, but at least two professors—Marty and ES—mentioned that they actively considered the progress of the cohort, reorganizing learning activities or creating new activities as needed. This kind of reactive pedagogy required a close relationship with students as informants, open lines of communication and trust, and a willingness to flexibly shift the formal pedagogy to suit the broader learning goals determined by the professor(s). In several cases during the Fall 2013 semester, this legitimation extended far beyond the classroom to a larger community dimension, such as when Marty worked "behind the scenes" to encourage first year students to hold their own cohort meeting.

This is an ideal case of legitimating informal learning communities, where the backchannel encouragement on the part of faculty was valued and accepted by students. In cases where trust between faculty and students does not exist, these same actions may have been interpreted as meddling rather than legitimation, which indicates the overall importance of creating a cohesive community for student and faculty voices to be valued. A true bi-directional accounting of learning must be considered, especially as learning experiences are conceived and enacted in a constructivist paradigm; and a true accounting for learner agency must be at the center of this model, as an interactive, non-replicable experience.

For Teaching in the Studio Mode

I posit that the studio is not what is designed or constructed to be experienced; more accurately, the studio *is* what is experienced. This presents substantial implications for how we conceive of the studio in the literature, and how the cultural traditions of the studio are

experienced—even in their appropriated forms, such as those in this HCI studio—by learners. This design program represents an interesting variation of the traditional studio mode as is common in art and design education, which perhaps provides scholars with a new context to evaluate how the studio mode is interpreted and enacted. The development of several unique studio experiences, as was found in this program in various classroom studios and the student-led non-classroom studio, may be an indicator of the diversity that can develop around the studio mode, even without an academic or cultural history on the part of the academic discipline, faculty, or students. The experiences in this program imply that it is the studio mode—in all of its variations— that bridged classroom instruction with informal interaction, bringing together academic preparation and creative production in a variety of contexts, with students playing a range of roles. In this way, I feel it is productive to think of the studio both as a physical location—with spatial and temporal relations—and as a container for relevant pedagogical approaches that are experienced by learners in culturally significant ways.

One of the most substantial implications of this study in terms of teaching in the studio mode is that this design-based program was quite successful, even as it departed in substantial ways from what might be termed "traditional" studio. This indicates that studio is quite malleable as a collection of pedagogical experiences and approaches, and even though it is devoid of a rich visual culture characterized by readily available precedent (Vyas & Nijholt, 2012), and even though faculty members primarily engaged in research rather than creative production, many of the cultural imperatives of the studio were still preserved through a combination of classroom integration, faculty legitimation, and student community and socialization. So while someone like myself with a background in multiple studio contexts could find some sense of resonance with studio as it was interpreted and constructed in this program, this was also a recognizably unique instantiation of studio—without direct correspondence to other studio cultures (e.g., HCI as informed by architecture in Cennamo & Brandt, 2012).

Just because the studio culture of this program is working in its current form does not indicate that further inquiry is useless. While substantial portions of studio pedagogy were intact in this program, the ways in which the normative framework of the studio was implemented and reproduced over time presents hints at implications for how we view learner and faculty roles, and what system relations and structures are ultimately responsible for the creation of an adaptable, yet recognizable studio culture. Parts of the studio experience that are present in traditional studios due to the professional orientation of the discipline (e.g., construction of physical models in architecture, designerly communication surrounding framing of design problems) were also present in this studio environment; in both cases, the normative fabric of the culture is perpetuated by the students who travel through the program, although students in this ethnography bore more of the weight of reproduction, since the faculty members, by and large, were not practicing designers themselves, and lacked the rich experience of being educated in a studio context. This actually represents a fascinating turnabout: traditional studio has often been thoughtlessly reproduced by design-students-turned-faculty, who continue the same cultural traditions of the studio because they experienced them as a student, without a clear understanding of why those traditions or structures are successful (e.g., Anthony, 1991).

This implies that while there are likely some core elements that constitute a "studio," in this case, removing a classroom-bound studio as the primary student experience still resulted in many of the same studio-like behaviors being reproduced through student-led interactions. The most critical element of the studio seems to be the designerly orientation of the discipline in which the studio pedagogy is carried out; it appears that studio, as culturally reproduced by students in this program, succeeded because there was an underlying understanding of what constituted design activity, and the relationship of that design activity to the core distinctives of HCI. Other disciplines with less ties to traditional understandings of design (e.g., computer science) that take on the

studio mode might be less likely to reproduce a design school-like culture, but the studio may evolve yet again in different directions.

Limitations

The goal of a critical ethnography like this is not to comprehensively analyze and present all data collected. This would be virtually impossible with a large dataset, such as I have gathered here. Instead, my goal has been to present the rich, complex, and often overlaid range of interpretations and meaning making that may exist in this specific design program. Since the power of critical research within this framing is exploring the underlying structures and system relations that allow for communication to take place, this study is highly suggestive for future research, theorization of studio pedagogical approaches, and instructional design practice. But care must be taken not to overgeneralize these findings, within this specific research site, or more broadly in design pedagogies of any form.

This study is limited to a single site and single program across a single year, so there are limitations to generalizing across other design programs in HCI, other HCI programs in general, or to design education programs at large. What I am able to demonstrate through this study, however, is the complexity of the felt student experience in relation to the planned or formal pedagogy; within this framing, generalization is not a concern.

I was limited as a human instrument in the ethnographic process—by the sheer number of interactions and diversity of interactions I was able to capture, the participants that I was able to develop relationships with and subsequently with whom to gain insider status, the voices I was able to represent, and the kinds of analysis I was able to perform. These are all inherent limitations of the method, and I have attempted to present my method for selecting relevant and salient interactions as clearly as possible in chapter three. There is a strong element of personality that shapes the process of being an ethnographer in an environment like a design studio. For example, I was unable to gain insider status into many of the stories and experiences of non-native speakers;

while I attempted to collect data from these individuals wherever possible, and recruited a substantial number of non-native speakers for interviews, I cannot claim to have fully captured their story as much as I might have the dominant Caucasian Midwestern male persona. I did attempt to represent the dominant voices, roles, and typifications in the studio, which were largely dominated by native-speaking students, and often unintentionally, yet implicitly, silenced non-native speakers.

In terms of analytic method, I chose pivotal events to analyze in greater depth through reconstructive analysis. I selected interactions that appeared most salient and representative of the overall narrative I had constructed, but there are hundreds of hours of audio, thousands of photos, and many pages of field notes that have not been scrutinized as closely as the events selected and presented in chapter seven. While the narrative that is presented in chapters five and six represents the dominant themes from multiple sources of data, other narratives and voices likely exist and are underrepresented in this recounting of the student experience. The narrative I constructed presents a broad overview of the program experience, drawing on multiple voices to represent the complexity and variety of interpretation surrounding some of the main events. Because I had insider status in each of these groups, I feel I was able to render a relatively comprehensive picture of the overall experience, even if I have failed to capture every critical event. Many volumes would be needed to expand the precise experience for even one semester's worth of data. Reconstructions were performed based on my knowledge of multiple communities within the program, and I have attempted to reconcile and present as broad a range as possible. I brought a range of lived experiences as mentor, student, and researcher in this space; and my peer debriefer similarly brought experiences as associate instructor, mentor, Master's student, and PhD student.

Future Research

The edges of the studio are much more diffuse than previously theorized by Brandt et al. (2013) and Shaffer (2003). Rather than merely rendering the structures and relationships from a viewpoint that privileges the curricular or professor perspective, our theoretical model of the studio

must expand, being informed by the student perspective, opening up a discussion about idealized and real relationships between research and practice communities as students move from the role of learner to that of designer.

While the studio bridge may be strongly influenced in one direction or another from a curricular standpoint, this does not mean that the student also experiences that bridge in the same way. When refocusing the conversation to locate the locus of identity—in Brandt et al.'s (2013) rendering of a community of practice—students may identify in very different ways from the program at large. In this study, I have demonstrated the dominant and privileged discourse of HCI as relating to an academic and scholarly community, with participation in ACM, attendance at the SIGCHI conference, and the reading of related literature. I have also demonstrated the student tendency towards privileging a practice-oriented discourse of HCI, including participation in more mainstream conferences like IXDA, Interactions, and SxSW, with a pragmatic view towards resources, methods, and tools that inform their practice.

Future work in this area can extend in many directions, including a focus on: the informal studio, the student experience of formal pedagogy, the legitimation of informal practices by professors, or the creation of a design studio or critique culture. While this study maps some of these relationships in a limited way in a single design program, more work is needed across multiple signature pedagogies—design and traditional instructional modes among them—to understand the dynamic roles of professor, student, and proto-professional.

Specific opportunities for research include work in three broad categories: 1) descriptive and critical research on the integration and appropriation of the studio method in emergent design disciplines; 2) exploration of student and proto-professional roles in professionalized Master's programs, particularly in design disciplines; and 3) the potential relationships between identity construction of individual design students and the formation and legitimation of informal student communities. Each of these areas of research is highly complex, and this study provides only a

tentative starting point with which to proceed; however, as design education, and professional education at large, continues to grow, a clearer understanding of how students create and enact roles in relation to the informal and formal pedagogy, directed towards their future professional identity, is of utmost importance. If, as this study indicates, attention is paid not only to the formal pedagogy, but also to how that pedagogy is experienced by learners, each of whom bring their own dynamic sense of professional and designerly identity, this knowledge will not only further our understanding of how to produce more effective educational experiences, but also enhance our knowledge of design competency, development of expertise, and professional design activity.

References

Anthony, K. H. (1991). *Design juries on trial: The renaissance of the design studio.* New York, NY: Van Nostrand Reinhold.

Bailey, R. O. (2005). *The digital design coach: Enhancing design conversations in architecture education.* (Unpublished doctoral dissertation). Victoria University of Wellington, Wellington, New Zealand. Retrieved from http://researcharchive.vuw.ac.nz/handle/10063/392

Barrett, T. (1988). A comparison of the goals of studio professors conducting critiques and art education goals for teaching criticism. *Studies in Art Education*, *30*(1), 22-27.

Barrett, T. (1997). *Talking about student art.* Worcester, MA: Davis Publications.

Barrett, T. (2000). Studio critiques of student art: As they are, as they could be with mentoring. *Theory Into Practice*, *39*(1), 29-35.

Belluigi, D. Z. (2008). *Excavating the 'critique': An investigation into disjunctions between the espoused and the practiced within a fine art studio practice curriculum.* (Master's thesis). Retrieved from http://eprints.ru.ac.za/972/1/BelluigiMEd2008.pdf

Bilek-Golias, B. A. (2012). *An ethnographic inquiry into a curriculum culture: Studying how a liberal arts approach and leadership studies may be embodied and enacted in the design studio within an architectural professional education.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. AAT 3534939).

Blair, B. (2007). At the end of a huge crit in the summer, it was crap I'd worked really hard but all she said was fine and I was gutted. *Art, Design & Communication in Higher Education*, *5*(2), 83-95. doi:10.1386/adch.5.2.83/1

Blair, B. (2010). *Perception, interpretation, impact: An examination of the learning value of formative feedback to students through the design studio critique.* Retrieved from http://eprints.kingston.ac.uk/6320/1/Blair-B-6320.pdf

Blair, B. (2011). An examination of student formative assessment and face to face feedback in studio-based design education & its relationship to students' learning experiences. *20/20 Design Vision*, 19-27.

Blevis, E., Lim, Y. -K., Stolterman, E., Wolf, T. V., & Sato, K. (2007). Supporting design studio culture in HCI. In *CHI EA '07: CHI '07 extended abstracts on human factors in computing systems* (pp. 2821-2824). New York, NY: ACM Press. doi:10.1145/1240866.1241086

Blevis, E., Rogers, Y., Siegel, M., Hazlewood, W., & Stephano, A. (2004). Integrating HCI and design: HCI/d at IUB, a design education case story. In *Zimmerman, J., Evenson, S., Baumann, K., & Purgathofer, P. Workshop on the relationship between design and HCI. ACM CHI 2004 conference on human factors and computing systems.* Vienna, Austria.

Blythman, M., Orr, S., & Blair, B. (2007). *Critiquing the crit*. The Higher Education Academy, Art, Design and Media Subject Centre. Retrieved from https://intranet.rave.ac.uk/download/attachments/121176147/LTR080107-Critprojectfinalsentreportversion2.doc?version=1&modificationDate=1321008897257

Bødker, S. (2006). When second wave HCI meets third wave challenges. In *Proceedings of the 4th Nordic Conference on Human-Computer Interaction: Changing Roles* (pp. 1-8), Oslo, Norway. ACM Press: New York, NY.

Boellstorff, T., Nardi, B., Pearce, C., & Taylor, T. L. (2012). *Ethnography and virtual worlds: A handbook of method.* Princeton, NJ: Princeton University Press.

Boling, E., & Smith, K. M. (2010). *Intensive studio experience in a non-studio masters program: Student activities and thinking across levels of design.* Montréal: Design Research Society International Conference.

Bowring, J. (2000). Increasing the critical mass: Emphasising critique in studio teaching. *Landscape Review*, *6*(2), 41-52.

Brandom, R. B. (1998). *Making it explicit: Reasoning, representing, discursive commitment.* Cambridge, MA: Harvard University Press.

Brandt, C. B., Cennamo, K., Douglas, S., Vernon, M., McGrath, M., & Reimer, Y. (2013). A theoretical framework for the studio as a learning environment. *International Journal of Technology and Design Education, 23*(2), 329-348. doi:10.1007/s10798-011-9181-5

Brown, A. (1999). *Strategies for the delivery of instructional design coursework: Helping learners develop a professional attitude toward the production process. .* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. AAT 9962697).

Brown, J. S. (2002). The social life of learning: How can continuing education be reconfigured in the future? *Continuing Higher Education Review*, *66*, 50-69.

Callison, M. (2011). A design case featuring the graduate design studio at Indiana University Bloomington's human-computer interaction design program. *International Journal of Designs for Learning*, *2*(1).

Carspecken, P. F. (1996). *Critical ethnography in educational research: A theoretical and practical guide.* New York, NY: Routledge.

Carspecken, P. F. (2003). Ocularcentrism, phonocentrism and the counter enlightenment problematic: Clarifying contested terrain in our schools of education. *The Teachers College Record*, *105*(6), 978-1047.

Carspecken, P. F. (1991). Community schooling and the nature of power: An analysis of the battle for Croxteth comprehensive. London, UK: Routledge.

Carspecken, P. F., & MacGillivray, L. (1998). Raising consciousness about reflection, validity, and meaning. In G. Shacklock & J. Smyth (Eds.), *Being reflexive in critical educational and social research* (pp. 171-190). London, UK: Falmer Press.

Carspecken, P., & Zhang, R. (2013). Content inference fields in intersubjective space: Transpersonal position, illocution, and logic in the analysis of human interactions. In B. Dennis, L.

Carspecken, & P. F. Carspecken (Eds.), *Qualitative research: A reader in philosophy, core concepts, and practice* (pp. 201-242). New York, NY: Peter Lang Publishing.

Casakin, H., & Kreitler, S. (2008). Correspondences and divergences between teachers and students in the evaluation of design creativity in the design studio. *Environment and Planning B: Planning And Design*, *35*(4), 666-678.

Cennamo, K., & Brandt, C. (2012). The "right kind of telling": Knowledge building in the academic design studio. *Educational Technology Research and Development*, 1-20. doi:10.1007/s11423-012-9254-5

Cennamo, K., Brandt, C., & Scott, B. (2010). Adapting the studio to design-based disciplines: Research-Based strategies for effective practice. In *Proceedings of the 2010 conference on higher education pedagogy, Blacksburg, VA* (pp. 14-15). Retrieved from http://www.lulu.com/product/file-download/proceedings-of-the-2010-conference-on-higher-education-pedagogy/14415707?productTracking Context=search_results/search_shelf/center/6

Cennamo, K., Douglas, S. A., Vernon, M., Brandt, C., Scott, B., Reimer, Y., & McGrath, M. (2011). Promoting creativity in the computer science design studio. *Proceedings of the 42nd ACM Technical Symposium on Computer Science Education*, 649-654. New York, NY: ACM Press. doi:10.1145/1953163.1953344

Clinton, G., & Rieber, L. P. (2010). The studio experience at the University of Georgia: An example of constructionist learning for adults. *Educational Technology Research and Development*, *58*(6), 755-780. doi:10.1007/s11423-010-9165-2

Cockton, G. (2008). Revisiting usability's three key principles. In *CHI EA '08: CHI '08 Extended Abstracts on Human Factors in Computing Systems* (pp. 2473-2484). New York, NY: ACM Press. doi:10.1145/1358628.1358704

Conanan, D. M., & Pinkard, N. (2001). Students' perceptions of giving and receiving design critiques in an online learning environment. In *European conference on computer-supported collaborative learning (euro-cscl)*, 22-24.

Corroto, C. (1996). *Constructing architects: A critical ethnography.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. AAT 9620004).

Cret, P. P. (1941). The Ecole des Beaux-Arts and architectural education. *The Journal of the American Society of Architectural Historians*, *1*(2), 3-15.

Cross, N. (2001). Designerly ways of knowing: Design discipline versus design science. *Design Issues*, *17*(3), 49-55.

Crysler, C. G. (1995). Critical pedagogy and architectural education. *Journal of Architectural Education*, *48*(4), 208-217.

Cuff, D. (1991). *Architecture: The story of practice.* Cambridge, MA: MIT Press.

Dannels, D. P. (2009). Features of success in engineering design presentations: A call for relational genre knowledge. *Journal of Business and Technical Communication*, *23*(4), 399-427. doi:10.1177/1050651909338790

Dannels, D. P. (2005). Performing tribal rituals: A genre analysis of "crits" in design studios. *Communication Education*, *54*(2), 136-160.

Dannels, D., Gaffney, A., & Martin, K. (2008). Beyond content, deeper than delivery: What critique feedback reveals about communication expectations in design education. *International Journal for the Scholarship of Teaching and Learning*, *2*(2), 1-16.

Dannels, D. P., Housley Gaffney, A. L., & Martin, K. N. (2011). Students' talk about the climate of feedback interventions in the critique. *Communication Education*, *60*(1), 95-114. doi:10.1080/03634523.2010.487111

Dannels, D. P., & Martin, K. N. (2008). Critiquing critiques: A genre analysis of feedback across novice to expert design studios. *Journal of Business and Technical Communication*, *22*(2), 135-159. doi:10.1177/1050651907311923

Danvers, J. (2003). Towards a radical pedagogy: Provisional notes on learning and teaching in art & design. *International Journal of Art & Design Education*, *22*(1), 47-57.

Darder, A., Baltodano, M., & Torres, R. D. (2003). *The critical pedagogy reader.* New York, NY: Routledge Falmer.

de la Harpe, B., Peterson, J. F., Frankham, N., Zehner, R., Neale, D., Musgrave, E., & McDermott, R. (2009). Assessment focus in studio: What is most prominent in architecture, art and design? *International Journal of Art & Design Education*, *28*(1), 37-51.

Doren, M. C. (2011). *Talking to artists in their studio; reflection on the practice of assessment as learning.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. AAT 3484378).

Dozois, P. S. M. (2001). Construction through critique, the dialogic form of design studio teaching and learning. (Master's thesis). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. AAT MQ62721).

Dreyfus, H. L. (2003). *The Spinoza Lectures*. University of Amsterdam.

Dreyfus, S. E. (1981). *Formal models vs. Human situational understanding: Inherent limitations on the modeling of business expertise (ORC 81-3).* Berkeley: Operations Research Center, University of California.

Durling, D. (2002). Discourses on research and the PhD in design. *Quality Assurance in Education*, *10*(2), 79-85. doi:10.1108/09684880210423564

Dutton, T. A. (1987). Design and studio pedagogy. *Journal of Architectural Education*, *41*(1), 16-25.

Dutton, T. A. (1991). The hidden curriculum and the design studio: Toward a critical studio pedagogy. In T. A. Dutton (Ed.), *Voices in architectural education: Cultural politics and pedagogy* (pp. 165-194). New York, NY: Bergin & Garvey.

Ellmers, G. (2006). Reflection and graphic design pedagogy: Developing a reflective framework to enhance learning in a graphic design tertiary environment. In *Proceedings of thinking the future: Art, design and creativity: ACUADAS 2006 conference.*

Ellmers, G., Bennett, S. J., & Brown, I. M. (2009). Graphic design pedagogy: Employing reflection to support the articulation of knowledge and learning from the design experience. *Proc. EKSIG: Experiential Knowledge, Method Methodology*, 66-81.

Emerson, R. M., Fretz, R. I., & Shaw, L. L. (2011). *Writing ethnographic fieldnotes.* Chicago, IL: The University of Chicago Press.

Ertmer, P. A., & Cennamo, K. S. (1995). Teaching instructional design: An apprenticeship model. *Performance Improvement Quarterly*, *8*(4), 43-58.

Eshun, E. F., & Osei-Poku, P. (2013). Examining graphic design students' attitudes toward participative assessment in studio-based learning. *Arts and Design Studies*, *6*, 1-14.

Exter, M. E., Korkmaz, N., & Boling, E. (2009, October). Use of critique in an instructional design course: Perceived value and impact on students' design thinking. Paper presented at the annual meeting of the Association for Educational Communications and Technology, Louisville, KY.

Faiola, A. (2007). The design enterprise: Rethinking the HCI education paradigm. *Design Issues*, *23*(3), 30-45.

Fallman, D. (2003). Design-oriented human-computer interaction. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 225-232). New York, NY: ACM Press.

Frayling, C. (1993). *Research in art and design.* Royal College of Art London.

Freire, P. (2000). *Cultural action for freedom.* Cambridge, MA: Harvard Educational Review.

Freire, P. (1970/2000). *Pedagogy of the oppressed.* New York, NY: Continuum.

Gaffney, A. L. H. (2010). *Communicating about, in, and through design: A study exploring communication instruction and design students' critique performance.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. AAT 3429720).

Gayol, V. (1994). *The studio critique: Perceptions of college students and their instructors.* (Unpublished master's thesis). Temple University, Philadelphia, PA.

Gibbons, A. S., Boling, E., & Smith, K. M. (2014). Instructional design models. In *Handbook of research on educational communications and technology* (pp. 607-615). New York, NY: Springer New York. doi:10.1007/978-1-4614-3185-5_48

Giddens, A. (1979). *Central problems in social theory: Action, structure, and contradiction in social analysis.* Berkeley, CA: University of California Press.

Giroux, H. A., & Purpel, D. E. (1983). *The hidden curriculum and moral education: Deception or discovery?* Berkeley, CA: McCutchan.

Giroux, H. A. (2011). *On critical pedagogy.* New York, NY: Continuum International Publishing Group.

Graham, E. M. (2003). *Studio design critique: Student and faculty expectations and reality.* (Master's thesis). Retrieved from http://etd.lsu.edu/docs/available/etd-0611103-184324/unrestricted/Graham_thesis.pdf

Gray, C. M. (2013a). Discursive structures of informal critique in an HCI design studio. In *Nordes 2013: Experiments in design research* (pp. 110-118). Copenhagen, Denmark/Malmö, Sweden.

Gray, C. M. (2013b). Emergent critique in informal design talk: Reflections of surface, pedagogical, and epistemological features in an HCI studio. In *Critique 2013: An international conference*

reflecting on creative practice in art, architecture, and design (pp. 341-355). Adelaide, South Australia: University of South Australia.

Gray, C. M. (2013c). Factors that shape design thinking. *Design and Technology Education*, *18*(3), 8-20.

Gray, C. M. (2013d). Informal peer critique and the negotiation of habitus in a design studio. In *DRS // CUMULUS 2013: 2nd international conference for design education researchers* (pp. 702-714). Oslo, Norway: HiOA.

Gray, C. M. (2014). Evolution of design competence in UX practice. In *CHI'14: Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 1645-1654). New York, NY: ACM Press. doi: 10.1145/2556288.2557264

Gray, C. M., & Howard, C. D. (2014). Designerly talk in non-pedagogical social spaces. *Journal of Learning Design*, *7*(1), 40-58.

Gray, C. M., & Howard, C. D. (2013). Expectations of reciprocity? An analysis of critique in Facebook posts by student designers. In *Critique 2013: An international conference reflecting on creative practice in art, architecture, and design* (pp. 381-395). Adelaide, SA: University of South Australia.

Gray, C. M., & Siegel, M. A. (2013). Sketching design thinking: Representations of design in education and practice. In *DRS // CUMULUS 2013. 2nd international conference for design education researchers* (pp. 2008-2031). Oslo, Norway: HiOA.

Greenberg, S. (2009). Embedding a design studio course in a conventional computer science program. In *Creativity and HCI: From Experience to Design in Education* (pp. 23-41). Boston, MA: Springer.

Habermas, J. (1984). *The theory of communicative action, volume I.* Boston, MA: Beacon Press.

Habermas, J. (1987). *The theory of communicative action, volume II.* Boston, MA: Beacon Press.

Hakken, D. (1999). Doing ethnography in cyberspace. In *Cyborgs@ cyberspace?: An ethnographer looks to the future* (pp. 37-69). New York, NY: Routledge.

Hammersley, M., & Atkinson, P. (1995). *Ethnography: Principles in practice.* London, UK: Routledge.

Hassanpour, B., Utaberta, N., Tahir, M. M., Abdullah, N. A. G., Spalie, N., & Che-Ani, A. I. (2010). Developing sustainable approach in architectural education: Lesson from critique session experience of architecture studio program. In *Selected Topics in Education and Educational Technology, Proceedings of the Ninth Annual Conference on Education and Educational Technology* (pp. 325-330), Iwate, Japan.

Hassanpour, B., Utaberta, N., Zaharim, A., & Abdullah, N. G. (2011). Students' perception of the evaluation system in architecture studios. *World Academy of Science, Engineering and Technology*, *International Journal of Social, Human Science and Engineering, 5*(5), 24-30.

Hokanson, B. (2012). The design critique as a model for distributed learning. In L. Moller & J. B. Huett (Eds.), *The next generation of distance education: Unconstrained learning* (pp. 71-83). Boston, MA: Springer.

Hooper, S., Rook, M. M., & Choi, K. (forthcoming). *Reconsidering the design of a learning design studio*. Paper submitted to the 2014 AECT Summer Research Symposium: The Design of Learning Experience, Jacksonville, FL.

Jackson, P. W. (1968). *Life in classrooms.* New York, NY: Holt, Rinehart and Winston.

Jackson, T. A. (1999). Ontological shifts in studio art education: Emergent pedagogical models. *Art Journal*, *58*(1), 69-73.

Jarvis, S. (1998). *Adorno: A critical introduction.* New York, NY: Routledge.

Jeffers, C. S. (1994). The group studio critique as event: A problem-position. *American Educational Research Association Arts and Learning Research*, *11*(1), 57-66.

Joel, S. (2011). *Wild networks: The articulation of feedback and evaluation in a creative inter-disciplinary design studio.* (Doctoral thesis). Retrieved from http://researchrepository.napier.ac.uk/4578/1/Sian_Joel_Edgar_Final_Thesis_Version_Wild_Networks.pdf

Klebesadel, H. (2008). Reframing studio art production and critique. In *New museum theory and practice: An introduction* (pp. 247-265). Wiley Online Library.

Klebesadel, H., & Kornetsky, L. (2009). Critique as signature pedagogy in the arts. In R. Gurung, N. Chick, & A. Haynie (Eds.), *Exploring signature pedagogies: Approaches to teaching disciplinary habits of mind* (pp. 99-120). Sterling, VA: Stylus Publishing.

Koch, A. (2002). *The redesign of studio culture: A report of the AIAS studio culture task force.* American Institute of Architecture Students.

Kuhn, S. (2001). Learning from the architecture studio: Implications for project-based pedagogy. *International Journal of Engineering Education*, *17*(4/5), 349-352.

Kuutti, K. (2009). HCI and design: Uncomfortable bedfellows? In Binder, Löwgren, & Malmborg (Eds.), *(Re)searching the digital bauhaus* (pp. 43-60). London, UK: Springer.

Lassiter, L. E. (2005). *The Chicago guide to collaborative ethnography.* Chicago, IL: University of Chicago Press.

Lawson, B., & Dorst, K. (2009). *Design expertise.* Oxford, UK: Architectural Press.

Lueth, P. L. O. (2008). *The architectural design studio as a learning environment: A qualitative exploration of architecture design student learning experiences in design studios from first- through fourth-year.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. AAT 3307106).

Logan, C. D. (2006). Circles of practice: Educational and professional graphic design. *Journal of Workplace Learning*, *18*(6), 331-343. doi:10.1108/13665620610682062

Madison, D. S. (2005). *Critical ethnography: Method, ethics, and performance.* Thousand Oaks, CA: Sage Publications.

Malinowski, B. (1922). Introduction: The subject, method and scope of this inquiry. In *Argonauts of the western pacific* (pp. 1-26). London, UK: Routledge.

Marcus, G. E. (2009). Introduction: Notes toward an ethnographic memoir of supervising graduate research through anthropology's decades of transformation. In J. D. Faubion & G. F. Marcus (Eds.), *Fieldwork is not what it used to be: Learning anthropology's method in a time of transition* (pp. 1-34). Ithaca, NY: Cornell University Press.

Margolin, V. (2010). Doctoral education in design: Problems and prospects. *Design Issues*, *26*(3), 70-78.

McPeek, K. T., & Morthland, L. (2010). Collaborative design pedagogy: An examination of the four levels of collaboration. In *Design & complexity: Design Research Society international conference, Montreal, Canada.* Retrieved from Google Scholar: http://www.designresearchsociety.org/docs-procs/DRS2010/PDF/085.pdf

Melles, G. (2008). Producing fact, affect and identity in architecture critiques a discourse analysis of student and faculty discourse interaction. *Art, Design & Communication in Higher Education*, *6*(3), 159-171.

Mewburn, I. (2012). Lost in translation: Reconsidering reflective practice and design studio pedagogy. *Arts and Humanities in Higher Education*, *11*(4), 363-379. doi:10.1177/1474022210393912

Modell, M. G., & Gray, C. M. (2011). Searching for personal territory in a human-computer interaction design studio. *Journal for Education in the Built Environment*, *6*(2), 54-78.

Morton, J., & O'Brien, D. (2006). Selling your design: Oral communication pedagogy in design education. *Communication Education*, *54*(1), 6–19. doi:10.1080/03634520500076885

Murphy, K. M., Ivarsson, J., & Lymer, G. (2012). Embodied reasoning in architectural critique. *Design Studies, 33*(63), 530-556.

NDEA to IST Years: 1957-1972 (n.d.). In *Indiana University School of Education Instructional Systems Technology*. Retrieved on June 7, 2014, from http://portal.education.indiana.edu/ist/AboutUs/DepartmentHistory/NDEAtoISTYears.aspx

Nelson, H. G., & Stolterman, E. (2012). *The design way: Intentional change in an unpredictable world* (2nd ed.). Cambridge, MA: MIT Press.

Neumann Jr, R. K. (1988). Preliminary inquiry into the art of critique, A. *Hastings LJ*, *40*, 725-769.

Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, *84*(3), 231-259.

Oak, A. (1998). Assessment and understanding: An analysis of talk in the design studio critique. In *Engendering communication-proceedings from the fifth Berkeley women and language conference, Berkeley, CA: University of California.*

Oak, A. (2002). It's a nice idea, but it's not actually real: Assessing the objects and activities of design. *Journal of Art & Design Education*, *19*(1), 86-95.

Oh, Y., Ishizaki, S., Gross, M. D., & Yi-Luen Do, E. (2012). A theoretical framework of design critiquing in architecture studios. *Design Studies, 34*(3), 302-325. doi:10.1016/j.destud.2012.08.004

Parnell, R., Sara, R., Doidge, C., & Parsons, M. L. (2012). *The crit: An architecture student's handbook* (2nd ed.). Oxford, UK: Architectural Press.

Parrish, P. (2014). Designing for the half-known world: Lessons for instructional designers from the craft of narrative fiction. In B. Hokanson & A. Gibbons (Eds.), *Design in educational technology* (pp. 261-270). Switzerland: Springer Verlag. doi:10.1007/978-3-319-00927-8_15

Parrish, P. E. (2009). Aesthetic principles for instructional design. *Educational Technology Research and Development*, *57*(4), 511-528. doi:10.1007/s11423-007-9060-7

Parrish, P. E. (2008). *Designing compelling learning experiences.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. AAT 3312862).

Parrish, P. E. (2005). Embracing the aesthetics of instructional design. *Educational Technology*, *45*(2), 16-25.

Parrish, P., Wilson, B. G., & Dunlap, J. C. (2011). Learning experience as transaction: A framework for instructional design. *Educational Technology*, *51*(2), 15-22.

Percy, C. (2004). Critical absence versus critical engagement: Problematics of the crit in design learning and teaching. *Art, Design & Communication in Higher Education*, *2*(3), 143-154.

Purchase, H. C. (2000). Learning about interface design through peer assessment. *Assessment & Evaluation in Higher Education*, *25*(4), 341-352.

Reimer, Y. J., & Douglas, S. A. (2003). Teaching HCI design with the studio approach. *Computer Science Education*, *13*(3), 191-205.

Ruchhoeft, P., Bannerot, R., & Kastor, R. (2004). Adapting the studio critique to large capstone design courses. In *Proceedings of the 2004 ASEE annual conference and exposition.* American Society for Engineering Education.

Rowland, G. (1993). Designing and instructional design. *Educational Technology Research and Development*, *41*(1), 79-91.

Rowland, G., Fixl, A., & Yung, K. (1992). Educating the reflective designer. *Educational Technology*, *32*(12), 36-44.

Salama, A. M. A., & Wilkinson, N. (2007). *Design studio pedagogy: Horizons for the future.* Gateshead, UK: Urban International Press.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action.* New York, NY: Basic Books.

Schön, D. A. (1985). *The design studio: An exploration of its traditions and potentials.* London, UK: RIBA Publications Limited.

Schön, D. A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions.* San Francisco, CA: Jossey-Bass.

Senturer, A., & Istek, C. (2000). Discourse as representation of design thinking and beyond: Considering the tripod of architecture—media, education, & practice. *Journal of Art & Design Education*, *19*(1), 72-85.

Shaffer, D. W. (2003). *Portrait of the oxford design studio: An ethnography of design pedagogy*. WCER Working Paper No. 2003-11. Madison, WI: University of Wisconsin-Madison, Wisconsin Center for Educational Research.

Shannon, S. J. (1995). *The studio critique in architectural education.* (Unpublished doctoral thesis). University of Adelaide, Adelaide, Australia.

Shulman, L. S. (2005). Signature pedagogies in the professions. *Daedalus*, *134*(3), 52-59.

Siegel, M. A., & Stolterman, E. (2008). Metamorphosis: Transforming non-designers into designers. In *Undisciplined! Proceedings of the design research society conference 2008* (pp. 378:1-13). Sheffield, UK: Sheffield Hallam University.

Smith, K. M., & Boling, E. (2009). What do we make of design? Design as a concept in educational technology. *Educational Technology*, *49*(4), 3-17.

Soep, E. (2006). Critique: Assessment and the production of learning. *The Teachers College Record*, *108*(4), 748-777.

Stevens, G. (1995). Struggle in the studio: A Bourdivin look at architectural pedagogy. *Journal of Architectural Education*, *49*(2), 105-122.

Stocking Jr, G. W. (1983). The ethnographer's magic: Fieldwork in British anthropology from Tylor to Malinowski. In *Observers observed: Essays on ethnographic fieldwork* (pp. 12-59). Madison, WI: University of Wisconsin Press.

Swales, J. M., Barks, D., Ostermann, A. C., & Simpson, R. C. (2001). Between critique and accommodation: Reflections on an EAP course for masters of architecture students. *English for Specific Purposes*, *20*, 439-458.

Taylor, M. -J., & McCormack, C. (2006). Creative critique in visual communication: Effective feedback in design projects through voice-centred studio-based communication and online delivery. In *Thinking the future: Art, design and creativity. Proceedings from the 2006 Australian council of university art and design schools (ACUADS) conference.*

Uluoglu, B. (2000). Design knowledge communicated in studio critiques. *Design Studies*, *21*(1), 33-58.

Utaberta, N., Hassanpour, B., Ani, A. I., & Surat, M. (2011). Reconstructing the idea of critique session in architecture studio. *Procedia-Social and Behavioral Sciences*, *18*, 94-102.

Utaberta, N., Hassanpour, B., Zaharin, A., & Surat, M. (2010). An analytical study of critique session in architecture design studio. In *2010 2nd international congress on Engineering education (ICEED)* (pp. 159-164). IEEE. doi:10.1109/ICEED.2010.5940783

Vyas, D., Veer, G., & Nijholt, A. (2012). Creative practices in the design studio culture: Collaboration and communication. *Cognition, Technology & Work, 15,* 415-443. doi:10.1007/s10111-012-0232-9

Webster, H. (2006). Power, freedom and resistance: Excavating the design jury. *International Journal of Art & Design Education*, *25*(3), 286-296.

Webster, H. (2007). The analytics of power: Re-presenting the design jury. *Journal of Architectural Education*, *60*(3), 21-27.

Webster, H. (2008). Architectural education after Schön: Cracks, blurs, boundaries and beyond. *Journal for Education in the Built Environment*, *3*(2), 63-74.

Willenbrock, L. (1991). An undergraduate voice in architectural education. In T. A. Dutton (Ed.), *Voices in architectural education: Cultural politics and pedagogy* (pp. 97-119). New York, NY: Bergin & Garvey.

Winograd, T. (1990). What can we teach about human-computer interaction?(Plenary address). In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 443-448). New York, NY: ACM Press.

Wolff, K. A. (2009). *The architecture studio: Its implications for instructional design education.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. AAT 3368354).

Xu, A., & Bailey, B. (2012). What do you think?: A case study of benefit, expectation, and interaction in a large online critique community. In *CSCW '12: Proceedings of the ACM 2012 conference on computer supported cooperative work* (pp. 295-304). New York, NY: ACM Press. doi:10.1145/2145204.2145252

Xu, A., & Bailey, B. P. (2011). A crowdsourcing model for receiving design critique. In *CHI EA '11: Proceedings of the 2011 annual conference extended abstracts on human factors in computing systems* (pp. 1183-1188). New York, NY: ACM Press. doi:10.1145/1979742.1979745

Zhang, R., & Carspecken, P. (2013). Content inference fields in intersubjective space: Transpersonal position, illocution, and logic in the analysis of human interactions. In B. Dennis, L. Carspecken, & P. F. Carspecken (Eds.), *Qualitative research: A reader in philosophy, core concepts, and practice* (pp. 201-242). New York, NY: Peter Lang Publishing.

Zimmerman, J., Forlizzi, J., & Evenson, S. (2007). Research through design as a method for interaction design research in HCI. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 493-502). New York, NY: ACM Press.

APPENDICES

Appendix A:

Literature on Critique Categorized by Critique Type, Educational Context, and Design Field

	TYPE OF CRITIQUE				CONTEXT								
Author/Date	Formal	Seminar/Group	Desk	Peer	K-12	Undergraduate	Graduate	Practice	Professor v. Student	Empirical Data	Critical	Critique as Evaluation	Design Field
(Anthony, 1991)	•					•	•		•	•	•	•	Architecture
(Bailey, 2005)			•	•		•				•			Architecture
(Barrett, 1988)		•	•			•				•		•	Studio Art
(Barrett, 1997)		•			•								Studio Art
(Barrett, 2000)		•	•			•			•	•			Studio Art
(Belluigi, 2008)	•	•				•					•	•	Studio Art
(Blair, 2007)		•				•				○	•	•	Studio Art
(Blair, 2010)		•	•			•				○		•	Studio Art
(Blair, 2011)		•	•	○					•	•		•	N/A
(Blythman et al., 2007)	•	•	•	•		•				•		•	N/A
(Bowring, 2000)		•		•		•				○	•	•	Landscape Architecture
(Brandt et al., 2013)	○	•	•				•			•		•	HCI, Industrial Design, Architecture
(Brown, 1999)		•					•		•	•		•	Instructional Design
(Casakin & Kreitler, 2008)						•			•	•		•	Architecture
(Cennamo et al., 2011)		•	○				•			•		•	HCI, Industrial Design, Architecture
(Clinton & Rieber, 2010)		•	•	○			•			•			Instructional Design
(Conanan & Pinkard, 2001)				•			•			•			Software Design
(Dannels, 2005)	•	•	•			•	•			•		•	Graphic Design; Architecture; Industrial Design; Art and Design; Landscape Architecture

	TYPE OF CRITIQUE				CONTEXT								
Author/Date	Formal	Seminar/Group	Desk	Peer	K-12	Undergraduate	Graduate	Practice	Professor v. Student	Empirical Data	Critical	Critique as Evaluation	Design Field
(Dannels, 2009)	•					•				•		•	Engineering Design
(Dannels & Martin, 2008)	•	•				•	•			•		•	Graphic Design; Industrial Design; Art and Design; Landscape Architecture
(Dannels et al., 2008)	•					•	•			•		•	Graphic Design; Architecture; Industrial Design; Art and Design; Landscape Architecture
(Dannels, Housley Gaffney, & Martin, 2011)	•					•	•			•		•	Graphic Design; Architecture; Industrial Design; Art and Design; Landscape Architecture
(de la Harpe et al., 2009)						•	•						Architecture, Design, Art
(Doren, 2011)										•			Studio Art
(Dozois, 2001)													Interior Design
(Ellmers, 2006)						•				•			Graphic Design
(Ellmers, Bennett, & Brown, 2009)						•				•			Graphic Design
(Eshun & Osei-Poku, 2013)				•		•				•		•	Graphic Design
(Exter et al., 2009)		•					•			•			Instructional Design
(Gaffney, 2010)		•	•			•				•		•	Landscape Architecture
(Gayol, 1994)		•				•			•	•		•	Studio Art
(Graham, 2003)	•		•			•	•		•	•			Landscape Architecture
(Gray, 2013a)				•			•			•			HCI
(Gray, 2013d)				•			•		•[a]	•	•		HCI
(Hassanpour et al., 2010)	•	•	○	○		•			•[a]	•		•	Architecure
(Hassanpour, Utaberta, Zaharim, & Abdullah, 2011)	•	•	•	•		•	•		•[a]	•		•	Architecure
(Hokanson, 2012)	•	•	•	•		•	•					•	N/A
(Jeffers, 1994)		•				•	•		•	•			Art, Design, Art Education

	TYPE OF CRITIQUE				CONTEXT								
Author/Date	Formal	Seminar/Group	Desk	Peer	K-12	Undergraduate	Graduate	Practice	Professor v. Student	Empirical Data	Critical	Critique as Evaluation	Design Field
(Joel, 2011)	•	•		•			•			•		•	N/A
(Klebesadel, 2008)		•	•								•		Studio Art
(Klebesadel & Kornetsky, 2009)		•	•	•		•				•	•	•	Studio Art; Theater
(Logan, 2006)		•	•	○		•		•		•			Graphic Design
(McPeek & Morthland, 2010)						•	•	•		•			Architecture
(Melles, 2008)	○	•		•			•		•	•			Architecture
(Mewburn, 2012)		•	•				•			•	•		Architecture
(Morton & O'Brien, 2006)	•					•				•		•	Architecture
(Murphy, Ivarsson, & Lymer, 2012)	•						•			•			Architecture
(Neumann Jr, 1988)		•	•								•		N/A
(Oak, 1998)		•				•				•			3-D Design; Architecture
(Oak, 2002)	•					•				•	•		N/A
(Oh et al., 2012)	•	•	•	•							•		Architecture
(Parnell et al., 2012)	•	•	•	•		•	•						Architecture
(Percy, 2004)	•					•				•	•		Fashion; Graphic Design
(Purchase, 2000)				○		•				•		•	Interface Design
(Ruchhoeft et al., 2004)		•		○		•				•		•	Engineering
(Senturer & Istek, 2000)			•			•				•			Architecture
(Shannon, 1995)	•					•				•	•		Architecture
(Soep, 2006)				○	•					•			Creative Media Production
(Swales, Barks, Ostermann, & Simpson, 2001)	•						•			•		•	Architecture
(Taylor & McCormack, 2006)			•			•				•		•	Graphic Design

	TYPE OF CRITIQUE				CONTEXT								
Author/Date	Formal	Seminar/Group	Desk	Peer	K-12	Undergraduate	Graduate	Practice	Professor v. Student	Empirical Data	Critical	Critique as Evaluation	Design Field
(Uluoglu, 2000)	•			○		•				•			Architecture
(Utaberta et al., 2010)	•	•	•	○									Architecture
(Utaberta, Hassanpour, Ani, & Surat, 2011)	•	•	•			•				•			Architecture
(Vyas et al., 2012)				•		•	•			•			Industrial Design
(Webster, 2006)	•					•				•	•		Architecture
(Webster, 2007)	•					•				•	•		Architecture
(Willenbrock, 1991)	•						•				•		Architecture
(Xu & Bailey, 2011)				○				○		○			N/A
(Xu & Bailey, 2012)				○				○		•			N/A

Note. Closed circles represent a direct reference to the category of critique, educational context, or other factors. Open circles indicate a tacit or inferential reference to the category of critique, educational context, or other factors.

[a] Professor v. student experiences identified primarily from the student perspective.

Appendix B:

Study Recruitment Materials

Observation Notice

(sent via email by the Program Chair on 1/30/2013 and 8/25/2013)

Dear HCI/d Master's student,

I am a doctoral student in the Instructional Systems Technology in the School of Education, and am currently conducting an ethnographic research study on informal critique in the HCI design studio. I will be observing activities in the design studio during the spring and fall 2013 semesters as part of my dissertation study.

I may also request for you to participate in related interviews or focus groups based on my observations. Additional details about the study are available in the attached information sheet.

Best Regards,

Colin Gray

Interview Recruitment Email

Dear [Student Name],

I am a doctoral student in the Instructional Systems Technology in the School of Education, and am currently conducting an ethnographic research study on informal critique in the HCI design studio.

Based on your activity I have observed in the design studio space, I am requesting your participation in a 60-minute interview. The meeting time and place for these interviews will be arranged at your convenience, and any data you provide will be kept confidential. You will be compensated with a $10 gift card for your time.

If you are interested in participating, please reply to this email for further information. Thank you for your consideration in participating in this study.

Best Regards,

Colin Gray

Faculty Recruitment Email

Dear [Faculty Member Name],

I am a doctoral student in the Instructional Systems Technology in the School of Education, and am currently conducting an ethnographic research study on informal critique in the HCI design studio.

Your participation in this study is completely voluntary and you are free to discontinue your participation at any time. Your participation would include:

- Permission to observe any classes you teach in the HCI/d Master's program during the Fall 2013 semester
- Filling out reflections on a bi-weekly basis throughout the Fall 2013 semester about your goals for classroom instruction, and your perception of student learning (this reflection can be provided by email or 15-minute scheduled interview, and questions will be provided)

If you are interested in participating, please reply to this email for further information. Thank you for your consideration in participating in this study.

Best Regards,

Colin Gray

Appendix C:

Participant Observation Log

Spring 2013

ID	Date	Location	Start Time	End Time	Day of Week	Duration	Position
1.1	1/30/13	Studio	1:57 PM	3:40 PM	Wednesday	1:43:00	SW
1.2	1/31/13	Studio	1:34 PM	3:42 PM	Thursday	2:08:00	NE
1.3	2/5/13	Studio	9:29 AM	12:30 PM	Tuesday	3:01:00	E
1.4	2/6/13	Studio	10:35 AM	3:35 PM	Wednesday	5:00:00	NE
1.5	2/7/13	Studio	1:00 PM	3:32 PM	Thursday	2:32:00	NE
1.6	2/13/13	Studio	8:57 AM	12:07 PM	Wednesday	3:10:00	E
1.7	2/13/13	Studio	2:03 PM	3:42 PM	Wednesday	1:39:00	NW
1.8	2/14/13	Studio	8:31 AM	11:26 AM	Thursday	2:55:00	NE
1.9	2/18/13	Studio	9:04 AM	11:04 AM	Monday	2:00:00	NE
1.10	2/18/13	Studio	4:30 PM	5:22 PM	Monday	0:52:00	SE
1.11	2/19/13	Studio	9:55 AM	12:15 PM	Tuesday	2:20:00	W
1.12	2/20/13	Studio	8:44 AM	11:00 AM	Wednesday	2:16:00	NE
1.13	2/20/13	Studio	2:22 PM	3:30 PM	Wednesday	1:08:00	NE
1.14	2/21/13	Studio	11:58 AM	2:51 PM	Thursday	2:53:00	NW
1.15	2/21/13	Studio	5:02 PM	6:12 PM	Thursday	1:10:00	E
1.16	2/23/13	Studio	5:11 PM	7:32 PM	Saturday	2:21:00	NE
1.17	2/25/13	Studio	8:37 AM	10:09 AM	Monday	1:32:00	E
1.18	2/25/13	Studio	3:33 PM	6:01 PM	Monday	2:28:00	NE/NW
1.19	2/26/13	Studio	8:30 AM	12:00 PM	Tuesday	3:30:00	W
1.20	2/26/13	Studio	4:02 PM	4:14 PM	Tuesday	0:12:00	NE
1.21	2/27/13	Studio	11:18 AM	1:26 PM	Wednesday	2:08:00	NW
1.22	2/27/13	Studio	2:15 PM	2:51 PM	Wednesday	0:36:00	SW
1.23	2/28/13	Studio	8:27 AM	10:47 AM	Thursday	2:20:00	E
1.24	2/28/13	Studio	12:53 PM	3:50 PM	Thursday	2:57:00	NW
1.25	3/3/13	Studio	12:20 PM	2:00 PM	Sunday	1:40:00	E
1.26	3/4/13	Studio	9:08 AM	11:45 AM	Monday	2:37:00	NW
1.27	3/5/13	Studio	9:57 AM	12:15 PM	Tuesday	2:18:00	NE
1.28	3/5/13	Studio	4:05 PM	5:15 PM	Tuesday	1:10:00	SE
1.29	3/6/13	Studio	9:38 AM	11:00 AM	Wednesday	1:22:00	NW
1.30	3/6/13	Studio	1:00 PM	3:30 PM	Wednesday	2:30:00	SE
1.31	3/7/13	Studio	8:35 AM	11:30 AM	Thursday	2:55:00	W
1.32	3/7/13	Studio	3:52 PM	5:10 PM	Thursday	1:18:00	SW
1.33	3/20/13	Studio	11:56 AM	2:59 PM	Wednesday	3:03:00	SW
1.34	3/21/13	Studio	9:55 AM	11:40 AM	Thursday	1:45:00	E
1.35	3/21/13	Studio	1:40 PM	2:47 PM	Thursday	1:07:00	W
1.36	3/21/13	Studio	4:14 PM	6:30 PM	Thursday	2:16:00	NW
1.37	3/22/13	Studio	1:40 PM	3:20 PM	Friday	1:40:00	W
1.38	3/23/13	Studio	2:26 PM	5:00 PM	Saturday	2:34:00	E
1.39	3/25/13	Studio	3:36 PM	6:50 PM	Monday	3:14:00	W
1.40	3/26/13	Studio	8:41 AM	12:06 PM	Tuesday	3:25:00	NE
1.41	3/27/13	Studio	12:10 PM	3:32 PM	Wednesday	3:22:00	SE
1.42	3/28/13	Studio	3:38 PM	6:30 PM	Thursday	2:52:00	E

ID	Date	Location	Start Time	End Time	Day of Week	Duration	Position
1.43	3/29/13	Studio	1:18 PM	3:20 PM	Friday	2:02:00	NE
1.44	4/1/2013	Studio	4:30 PM	6:25 PM	Monday	1:55:00	NE
1.45	4/2/2013	Studio	9:13 AM	12:21 PM	Tuesday	3:08:00	E
1.46	4/2/2013	Studio	4:24 PM	6:30 PM	Tuesday	2:06:00	SE
1.47	4/3/2013	Studio	12:29 PM	3:30 PM	Wednesday	3:01:00	NW
1.48	4/4/2013	Studio	2:38 PM	5:23 PM	Thursday	2:45:00	W
1.49	4/5/2013	Studio	12:23 PM	2:30 PM	Friday	2:07:00	NW
1.50	4/9/2013	Studio	9:15 AM	12:12 PM	Tuesday	2:57:00	NE
1.51	4/9/2013	Studio	4:07 PM	5:32 PM	Tuesday	1:25:00	W
1.52	4/10/2013	Studio	8:59 AM	11:48 AM	Wednesday	2:49:00	E
1.53	4/11/2013	Studio	2:32 PM	5:40 PM	Thursday	3:08:00	W
1.54	4/12/2013	Studio	1:50 PM	4:25 PM	Friday	2:35:00	--/NW
1.55	4/15/2013	Studio	3:12 PM	5:42 PM	Monday	2:30:00	NW
1.56	4/16/2013	Studio	4:02 PM	6:00 PM	Tuesday	1:58:00	SE
1.57	4/17/2013	Studio	1:58 PM	3:45 PM	Wednesday	1:47:00	W
1.58	4/18/2013	Studio	12:08 PM	2:40 PM	Thursday	2:32:00	E
1.59	4/18/2013	Studio	5:01 PM	5:53 PM	Thursday	0:52:00	--
1.60	4/18/2013	Studio	5:56 PM	8:09 PM	Thursday	2:13:00	--
1.61	4/19/2013	Studio	12:20 PM	2:30 PM	Friday	2:10:00	NE
1.62	4/22/2013	Studio	2:08 PM	4:08 PM	Monday	2:00:00	SW
1.63	4/22/2013	Studio	5:27 PM	7:05 PM	Monday	1:38:00	--
1.64	4/23/2013	Studio	9:41 AM	12:00 PM	Tuesday	2:19:00	SE
1.65	4/24/2013	Studio	10:54 AM	1:00 PM	Wednesday	2:06:00	E
1.66	4/25/2013	Studio	1:03 PM	3:00 PM	Thursday	1:57:00	NE
1.67	4/26/2013	Studio	9:40 AM	12:00 PM	Friday	2:20:00	NW
					TOTAL	**150:26:00**	

Fall 2013

ID	Date	Location	Start Time	End Time	Day of Week	Duration	Position
2.1	8/21/2013	Orientation	8:40 AM	1:17 PM	Wednesday	4:37:00	SE
2.2	8/25/2013	Mentor Mtg.	7:51 PM	9:58 PM	Sunday	2:07:00	--
2.3	8/26/2013	I541	8:55 AM	10:58 AM	Monday	2:03:00	NE
2.4	8/26/2013	Studio	11:01 AM	12:06 PM	Monday	1:05:00	W
2.5	8/26/2013	I542	2:27 PM	3:46 PM	Monday	1:19:00	SE
2.6	8/26/2013	Prototyping	3:47 PM	4:55 PM	Monday	1:08:00	SE
2.7	8/27/2013	Studio	12:53 PM	3:00 PM	Tuesday	2:07:00	E
2.8	8/28/2013	Studio	12:40 PM	2:50 PM	Wednesday	2:10:00	SE
2.9	8/29/2013	I541	8:25 AM	11:00 AM	Thursday	2:35:00	NW
2.10	8/29/2013	Studio	11:04 AM	12:45 PM	Thursday	1:41:00	SW
2.11	8/29/2013	RDSC	5:41 PM	7:15 PM	Thursday	1:34:00	NW
2.12	8/29/2013	Therapy	7:18 PM	9:00 PM	Thursday	1:42:00	NW
2.13	9/2/2013	Studio	12:27 PM	2:45 PM	Monday	2:18:00	SE
2.14	9/5/2013	I541	8:45 AM	10:59 AM	Thursday	2:14:00	N
2.15	9/5/2013	Studio	11:16 AM	11:40 AM	Thursday	0:24:00	E

ID	Date	Location	Start Time	End Time	Day of Week	Duration	Position
2.16	9/5/2013	RDSC	5:39 PM	7:17 PM	Thursday	1:38:00	NE
2.17	9/5/2013	Therapy	7:27 PM	9:05 PM	Thursday	1:38:00	NE
2.18	9/5/2013	Mentor Mtg.	9:16 PM	9:45 PM	Thursday	0:29:00	N
2.19	9/6/2013	Studio	10:20 AM	12:31 PM	Friday	2:11:00	NE
2.20	9/7/2013	Studio	7:02 PM	9:12 PM	Saturday	2:10:00	NW
2.21	9/8/2013	Studio	12:14 PM	2:18 PM	Sunday	2:04:00	W
2.22	9/9/2013	I541	8:48 AM	11:00 AM	Monday	2:12:00	NW
2.23	9/9/2013	Studio	11:01 AM	12:22 PM	Monday	1:21:00	SW
2.24	9/9/2013	I604	1:07 PM	2:18 PM	Monday	1:11:00	SW
2.25	9/9/2013	Prototyping	2:25 PM	5:00 PM	Monday	2:35:00	NW
2.26	9/10/2013	Studio	2:55 PM	5:30 PM	Tuesday	2:35:00	E
2.27	9/10/2013	RDSC	5:33 PM	7:15 PM	Tuesday	1:42:00	N
2.28	9/11/2013	Studio	11:52 AM	2:22 PM	Wednesday	2:30:00	NW
2.29	9/11/2013	I542	2:30 PM	3:45 PM	Wednesday	1:15:00	SE
2.30	9/12/2013	I541	8:50 AM	11:00 AM	Thursday	2:10:00	S
2.31	9/12/2013	Therapy	7:24 PM	9:00 PM	Thursday	1:36:00	N
2.32	9/13/2013	Studio	12:41 PM	3:00 PM	Friday	2:19:00	SE/E
2.33	9/14/2013	Studio	1:12 PM	2:15 PM	Saturday	1:03:00	W
2.34	9/15/2013	Studio	2:45 PM	4:04 PM	Sunday	1:19:00	SW
2.35	9/16/2013	Studio	10:42 AM	1:15 PM	Monday	2:33:00	W
2.36	9/16/2013	I542	2:30 PM	3:49 PM	Monday	1:19:00	SE
2.37	9/17/2013	Studio	3:47 PM	5:25 PM	Tuesday	1:38:00	NW
2.38	9/18/2013	I604	1:13 PM	2:14 PM	Wednesday	1:01:00	SW
2.39	9/18/2013	I542	2:30 PM	3:51 PM	Wednesday	1:21:00	E
2.40	9/19/2013	I541	9:00 AM	11:01 AM	Thursday	2:01:00	NW
2.41	9/19/2013	Therapy	7:31 PM	9:00 PM	Thursday	1:29:00	N
2.42	9/24/2013	Studio	1:10 PM	4:01 PM	Tuesday	2:51:00	NW
2.43	9/24/2013	Studio	5:04 PM	5:35 PM	Tuesday	0:31:00	W
2.44	9/24/2013	RDSC	5:42 PM	7:21 PM	Tuesday	1:39:00	NE
2.45	9/26/2013	I541	8:58 AM	11:01 AM	Thursday	2:03:00	W
2.46	9/26/2013	Studio	11:03 AM	12:03 PM	Thursday	1:00:00	NE
2.47	9/26/2013	Therapy	7:27 PM	8:58 PM	Thursday	1:31:00	NE
2.48	9/26/2013	Yogi's	9:15 PM	11:59 PM	Thursday	2:44:00	--
2.49	9/27/2013	Studio	1:04 PM	2:08 PM	Friday	1:04:00	NE
2.50	9/28/2013	Studio	6:54 PM	8:30 PM	Saturday	1:36:00	SE
2.51	9/30/2013	I541	8:55 AM	11:01 AM	Monday	2:06:00	SE
2.52	9/30/2013	Studio	11:03 AM	11:58 AM	Monday	0:55:00	W
2.53	9/30/2013	I604	1:15 PM	2:19 PM	Monday	1:04:00	SE
2.54	9/30/2013	Prototyping	2:26 PM	4:10 PM	Monday	1:44:00	N
2.55	9/30/2013	Studio	4:15 PM	5:39 PM	Monday	1:24:00	NE
2.56	10/1/2013	Studio	4:35 PM	5:28 PM	Tuesday	0:53:00	SW
2.57	10/1/2013	RDSC	5:35 PM	7:18 PM	Tuesday	1:43:00	SW
2.58	10/2/2013	Studio	12:07 PM	2:24 PM	Wednesday	2:17:00	SE
2.59	10/2/2013	Mentor Mtg.	7:41 PM	9:47 PM	Wednesday	2:06:00	W/S
2.60	10/3/2013	I541	8:56 AM	11:00 AM	Thursday	2:04:00	SW
2.61	10/3/2013	Studio	11:02 AM	12:15 PM	Thursday	1:13:00	NW
2.62	10/3/2013	Therapy	7:23 PM	9:00 PM	Thursday	1:37:00	N

ID	Date	Location	Start Time	End Time	Day of Week	Duration	Position
2.63	10/3/2013	Yogi's	9:15 PM	10:35 PM	Thursday	1:20:00	S
2.64	10/7/2013	I541	8:56 AM	10:57 AM	Monday	2:01:00	NW
2.65	10/7/2013	Studio	12:05 PM	2:20 PM	Monday	2:15:00	W
2.66	10/7/2013	Prototyping	2:23 PM	5:04 PM	Monday	2:41:00	N
2.67	10/8/2013	Studio	1:45 PM	4:00 PM	Tuesday	2:15:00	SW
2.68	10/9/2013	Studio	11:35 AM	1:12 PM	Wednesday	1:37:00	NE
2.69	10/9/2013	I604	1:12 PM	2:20 PM	Wednesday	1:08:00	E
2.70	10/9/2013	I542	2:25 PM	3:40 PM	Wednesday	1:15:00	SE
2.71	10/9/2013	Studio	3:45 PM	5:40 PM	Wednesday	1:55:00	S/W
2.72	10/10/2013	I541	8:55 AM	11:00 AM	Thursday	2:05:00	SE
2.73	10/10/2013	Studio	11:00 AM	1:01 PM	Thursday	2:01:00	SE
2.74	10/10/2013	Studio	5:45 PM	7:22 PM	Thursday	1:37:00	W
2.75	10/10/2013	Therapy	7:30 PM	9:00 PM	Thursday	1:30:00	NW
2.76	10/14/2013	I541	8:51 AM	10:14 AM	Monday	1:23:00	NE
2.77	10/14/2013	Studio	10:16 AM	11:39 AM	Monday	1:23:00	SE
2.78	10/14/2013	Studio	12:37 PM	1:10 PM	Monday	0:33:00	SE
2.79	10/14/2013	I604	1:13 PM	2:18 PM	Monday	1:05:00	SW
2.80	10/14/2013	I542	2:30 PM	3:45 PM	Monday	1:15:00	E
2.81	10/14/2013	Prototyping	3:45 PM	5:01 PM	Monday	1:16:00	NE
2.82	10/16/2013	Studio	9:56 AM	12:05 PM	Wednesday	2:09:00	E
2.83	10/16/2013	Studio	1:32 PM	4:43 PM	Wednesday	3:11:00	NW
2.84	10/17/2013	I541	8:40 AM	10:57 AM	Thursday	2:17:00	NW
2.85	10/17/2013	Studio	10:58 AM	1:54 PM	Thursday	2:56:00	W
2.86	10/17/2013	Therapy	7:21 PM	9:07 PM	Thursday	1:46:00	N
2.87	10/17/2013	Yogi's	9:15 PM	11:20 PM	Thursday	2:05:00	--
2.88	10/18/2013	Studio	3:15 PM	5:45 PM	Friday	2:30:00	SW
2.89	10/19/2013	Studio	1:12 PM	3:45 PM	Saturday	2:33:00	NW
2.90	10/21/2013	I541	8:53 AM	9:50 AM	Monday	0:57:00	S
2.91	10/21/2013	Studio	9:52 AM	12:55 PM	Monday	3:03:00	NW
2.92	10/21/2013	Studio	1:40 PM	2:06 PM	Monday	0:26:00	S/SW
2.93	10/21/2013	Prototyping	2:26 PM	9:00 PM	Monday	6:34:00	S
2.94	10/22/2013	Studio	3:15 PM	5:20 PM	Tuesday	2:05:00	SW
2.95	10/23/2013	Studio	11:28 AM	12:25 PM	Wednesday	0:57:00	SE
2.96	10/23/2013	I604	1:00 PM	2:27 PM	Wednesday	1:27:00	S
2.97	10/23/2013	I542	2:28 PM	3:49 PM	Wednesday	1:21:00	E
2.98	10/23/2013	Studio	8:02 PM	9:58 PM	Wednesday	1:56:00	NW
2.99	10/24/2013	I541	8:48 AM	11:01 AM	Thursday	2:13:00	NW
2.100	10/25/2013	Studio	12:26 PM	2:50 PM	Friday	2:24:00	W
2.101	10/27/2013	Studio	4:18 PM	7:50 PM	Sunday	3:32:00	W
2.102	10/28/2013	I541	8:52 AM	11:04 AM	Monday	2:12:00	N
2.103	11/4/2013	I541	8:49 AM	10:58 AM	Monday	2:09:00	N
2.104	11/4/2013	Studio	4:00 PM	5:15 PM	Monday	1:15:00	--
2.105	11/5/2013	Studio	1:05 PM	3:41 PM	Tuesday	2:36:00	NE
2.106	11/6/2013	Studio	11:32 AM	1:08 PM	Wednesday	1:36:00	SE
2.107	11/6/2013	I604	1:15 PM	2:30 PM	Wednesday	1:15:00	S
2.108	11/6/2013	I542	2:30 PM	3:45 PM	Wednesday	1:15:00	E
2.109	11/6/2013	Studio	3:50 PM	4:10 PM	Wednesday	0:20:00	--

ID	Date	Location	Start Time	End Time	Day of Week	Duration	Position
2.110	11/7/2013	I541	8:55 AM	10:53 AM	Thursday	1:58:00	SE
2.111	11/7/2013	Studio	2:05 PM	3:46 PM	Thursday	1:41:00	SE
2.112	11/9/2013	Studio	7:05 PM	9:20 PM	Saturday	2:15:00	W
2.113	11/10/2013	Studio	2:41 PM	3:50 PM	Sunday	1:09:00	SW
2.114	11/11/2013	I541	8:56 AM	11:01 AM	Monday	2:05:00	NW
2.115	11/11/2013	Studio	11:15 AM	1:38 PM	Monday	2:23:00	NE
2.116	11/12/2013	Studio	3:05 PM	5:40 PM	Tuesday	2:35:00	SE
2.117	11/12/2013	RDSC	5:41 PM	7:34 PM	Tuesday	1:53:00	NW
2.118	11/13/2013	Studio	11:35 AM	1:10 PM	Wednesday	1:35:00	SW
2.119	11/13/2013	I604	1:10 PM	2:20 PM	Wednesday	1:10:00	S
2.120	11/13/2013	I542	2:20 PM	3:55 PM	Wednesday	1:35:00	N
2.121	11/13/2013	Studio	3:55 PM	4:45 PM	Thursday	0:50:00	NE
2.122	11/14/2013	I541	8:55 AM	11:00 AM	Thursday	2:05:00	S
2.123	11/14/2013	Studio	11:00 AM	1:20 PM	Thursday	2:20:00	NW
2.124	11/14/2013	Studio	2:01 PM	2:55 PM	Thursday	0:54:00	NW
2.125	11/18/2013	I541	8:55 AM	11:03 AM	Monday	2:08:00	NE
2.126	11/18/2013	Studio	11:25 AM	1:00 PM	Monday	1:35:00	W
2.127	11/18/2013	I604	1:10 PM	2:18 PM	Monday	1:08:00	S
2.128	11/18/2013	Prototyping	2:20 PM	5:00 PM	Monday	2:40:00	N
2.129	11/19/2013	Studio	3:20 PM	5:35 PM	Tuesday	2:15:00	SW/E
2.130	11/19/2013	RDSC	5:35 PM	6:50 PM	Tuesday	1:15:00	SE
2.131	11/20/2013	Studio	9:25 AM	10:35 AM	Wednesday	1:10:00	NW
2.132	11/20/2013	Studio	12:38 PM	2:15 PM	Wednesday	1:37:00	W
2.133	11/20/2013	I542	2:20 PM	3:33 PM	Wednesday	1:13:00	E
2.134	11/20/2013	Studio	4:41 PM	5:06 PM	Wednesday	0:25:00	--
2.135	11/21/2013	I541	8:52 AM	11:00 AM	Thursday	2:08:00	N
2.136	11/21/2013	Studio	11:03 AM	11:50 AM	Thursday	0:47:00	SW
2.137	11/21/2013	RDSC	5:38 PM	7:24 PM	Thursday	1:46:00	SE
2.138	11/21/2013	Therapy	7:24 PM	9:09 PM	Thursday	1:45:00	SE
2.139	11/22/2013	Studio	1:02 PM	2:40 PM	Friday	1:38:00	SE
2.140	12/2/2013	I541	8:50 AM	11:04 AM	Monday	2:14:00	N
2.141	12/2/2013	Studio	11:09 AM	12:35 PM	Monday	1:26:00	W
2.142	12/3/2013	Studio	9:32 AM	10:50 AM	Tuesday	1:18:00	SW
2.143	12/3/2013	Studio	12:38 PM	2:00 PM	Tuesday	1:22:00	SE
2.144	12/4/2013	Studio	11:10 AM	1:10 PM	Wednesday	2:00:00	W
2.145	12/4/2013	I604	1:10 PM	2:25 PM	Wednesday	1:15:00	S
2.146	12/4/2013	I542	2:25 PM	3:53 PM	Wednesday	1:28:00	E
2.147	12/5/2013	I541	8:38 AM	11:01 AM	Thursday	2:23:00	NW
2.148	12/5/2013	Studio	11:01 AM	1:03 PM	Thursday	2:02:00	NW
2.149	12/5/2013	RDSC	5:45 PM	7:13 PM	Thursday	1:28:00	SW
2.150	12/5/2013	Therapy	7:15 PM	9:07 PM	Thursday	1:52:00	SW
2.151	12/6/2013	Studio	1:28 PM	3:10 PM	Friday	1:42:00	SW
2.152	12/7/2013	Studio	2:35 PM	4:20 PM	Saturday	1:45:00	SE
2.153	12/9/2013	I541	8:57 AM	11:03 AM	Monday	2:06:00	NE
2.154	12/9/2013	Studio	11:03 AM	1:07 PM	Monday	2:04:00	W
2.155	12/9/2013	I604	1:07 PM	2:23 PM	Monday	1:16:00	S
2.156	12/9/2013	Prototyping	2:23 PM	4:50 PM	Monday	2:27:00	N

ID	Date	Location	Start Time	End Time	Day of Week	Duration	Position
2.157	12/10/2013	Studio	9:35 AM	10:30 AM	Tuesday	0:55:00	NE
2.158	12/10/2013	RDSC	5:45 PM	7:15 PM	Tuesday	1:30:00	SE
2.159	12/11/2013	Studio	10:15 AM	2:25 PM	Wednesday	4:10:00	NE/NW
2.160	12/11/2013	I542	2:25 PM	3:00 PM	Wednesday	0:35:00	E
2.161	12/11/2013	Studio	4:35 PM	5:00 PM	Wednesday	0:25:00	S
2.162	12/12/2013	I541	8:55 AM	10:55 AM	Thursday	2:00:00	NE
2.163	12/12/2013	Studio	10:55 AM	1:00 PM	Thursday	2:05:00	SW
2.164	12/12/2013	Studio	5:05 PM	5:42 PM	Thursday	0:37:00	SE
2.165	12/12/2013	RDSC	5:42 PM	7:28 PM	Thursday	1:46:00	N
2.166	12/12/2013	Therapy	7:28 PM	9:08 PM	Thursday	1:40:00	N
2.167	12/13/2013	Studio	1:45 PM	6:42 PM	Friday	4:57:00	SW
2.168	12/15/2013	Party	7:00 PM	9:24 PM	Sunday	2:24:00	--
					TOTAL	**301:14:00**	

Appendix D:

Faculty Reflection Protocol

These questions were answered via email, or a 15-minute interview with the participant.

1. What are the learning goals you wanted your students to achieve in the last two weeks of [class name]?

2. What is your perception of learning, as defined by your goals in #1, by the students in [class name]? If there is a gap between the goals and perception of learning, why do you think it exists? How did you decide this gap existed?

Appendix E:

Student Interview Protocol

Topic Domain: Role of critique in design process

Lead-off Question: Can you remember a time in which a process of critique that happened in the studio during a design project was really valuable? Tell me about it [similar to other experiences of critique? What made it special? Could it happen with just any other personality?]

Back-up Question: Tell me about a time that have you asked for critique in the design studio from a peer?

Back-up Question: When you were asking for critique in the design studio [from participant observations], I observed that [actions observed]. Can you tell me about that experience?

Follow-up questions

- What did you expect to get out of the critique of your project?
- Did you make changes to your project based on the critique you received?
- Can you tell me about a time when you really felt your design ideas were misunderstood?
- Did the critique make you think about things you hadn't considered (different perspectives/potential users/hidden meanings/missed opportunities)?

Covert categories

- Design Process as related to critique and progress
- Perceived benefits of critique in informing the design process
- Positive attributes of critique for personal development
- The nature of the value: just for a better design? Or for personal growth somehow too?

Topic Domain: Beliefs about critique

Follow-up questions

- What was your relationship to the person whose artifact you were critiquing (personal/professional)?
- How did you feel while someone told you what they liked/disliked about your project?
- Do you care what others have to say about your work?
- Why did you seek out critique on your project?
- Can you think of an experience when someone said negative things about your work? How did you feel/respond?
- What did you expect the other person to say when you critiqued their work (so you knew they understood or agreed/disagreed)?
- Was it hard to know what to say when someone asked you to critique their work?
- Were you concerned about hurting the other person's feelings?
- Where did you engage in critique (in private/public/design space/closed room)?
- Would a different way of forming the critique have felt better or been more productive? What would have made it better or worse (language use, paralinguistics)?
- Would a different critique setting (location or time) change the outcome of the critique?

Covert categories

- Past experience giving or receiving critique
- Comfort level with giving or receiving critique
- Perceived power dynamic between persons involved in the critique
- Trust
- Role of nationality or non-native speaker status
- Feelings of communication (whether they feel they have communicated with the other person)
- Rationale for use of critique as a tool
- Fears or concerns about the process of critique, either giving or receiving

Appendix F:

Interview Log

Interview Date	Participant Name	Classification
3/6/2013	Omar	PhD
3/7/2013	Nathan	Masters (2014 cohort)
4/10/2013	Isabella	Masters (2014 cohort)
4/11/2013	Liz	Masters (2014 cohort)
4/12/2013	Megan	Masters (2013 cohort)
4/13/2013	Samuel	Masters (2013 cohort)
4/17/2013	Stephen	Masters (2014 cohort)
4/18/2013	Emily	Masters (2014 cohort)
4/24/2013	RM	Masters (2013 cohort)
4/26/2013	Ashleigh	Masters (2015 cohort)
4/27/2013	Avani	Masters (2013 cohort)
5/29/2013	Adam	Masters (2014 cohort)
7/17/2013	Marcus	PhD
11/20/2013	Sonya	Masters (2015 cohort)
11/21/2013	Naresh	PhD
11/21/2013	Adam	Masters (2014 cohort)
12/3/2013	Alec	Masters (2015 cohort)
12/3/2013	Stephen	Masters (2014 cohort)
12/4/2013	Emily	Masters (2014 cohort)
12/5/2013	Keisha	Masters (2015 cohort)
12/6/2013	Sanjiv	Masters (2015 cohort)
12/7/2013	Lulu	Masters (2015 cohort)
12/9/2013	Feng	Masters (2015 cohort)
12/10/2013	Valerie	Masters (2014 cohort)
12/10/2013	Corrie	Masters (2015 cohort)
12/10/2013	Anusha	Masters (2015 cohort)
12/11/2013	Danielle	Masters (2015 cohort)
12/11/2013	Camerson	Masters (2015 cohort)
12/13/2013	Brad	Masters (2015 cohort)
12/17/2013	Alexis	Masters (2015 cohort)

Note. Participants are identified by a pseudonym chosen by the researcher or participant, or a variation of their given name, if chosen by the participant.

Appendix G:

Privacy and Anonymization Form

A Google Form was distributed student-created Facebook groups in February and March 2014. A sample message sent to these groups is included below, along with the form where they could specify how they wanted to be recognized in the final report.

Identification in Dissertation Study

If you worked in the HCI/d design studio at Indiana University from January 30, 2013 - December 15, 2013, or took a course in the HCI/d curriculum during the Fall 2013 semester, I request that you fill out this brief form as part of study #1301010440.

Thank you so much for your contribution to my study.

-colin gray
comgray@indiana.edu

* Required

Your Name *

Email Address *

Use of Photos

I have collected a wide variety of photos (and some videos) in my fieldwork, including activities in both the studio and classroom spaces. I plan to use some subset of this media in research reports, and need your approval to use photos with any of your identifiable features.

In general, photos will be used to display typical activities in these environments (e.g., team meetings, sketching, prototyping, presentations, critique).

Do you give your permission for photos taken in the studio space or classroom that contain your identifiable features to be published in research reports? *

- ◯ Yes, and I understand my identifiable features may be linked to my pseudonym
- ◯ Yes, but do not use identifiable features in relation to my pseudonym
- ◯ No, please anonymize any photos of me
- ◯ Other:

Your Name and Identity

While you may choose to keep your identity in research reports and as anonymous as possible by using a pseudonym. You are also able to keep your public identity intact if you wish.

Your chosen method of identification will be used for all mentions of your activity in the design studio or classroom, including any interview data I collected from you (if applicable).

How do you wish to be identified in research reports? *
If you wish to be identified by a pseudonym and have a preference for this identity, please provide it in the "Other" answer field. I attempt to maintain as much authenticity in final research reports and presentations, so if you choose your own pseudonym, it would be helpful for you to choose a name that reflects your cultural and/or ethnic heritage.

- ○ By my first name
- ○ By my initials
- ○ By a pseudonym chosen by the researcher
- ○ Other:

Notification

Do you wish to receive updates when portions of this research are published and/or presented? *

- ○ Yes
- ○ No

Questions

If you have any questions, comments, or concerns about any of the questions above, or your role in the overall study, please provide a description of your concerns here. I will get back to you by email as soon as possible.

Submit

Never submit passwords through Google Forms.

Colin Michael Gray

comgray@indiana.edu

Education

June 2014 — **Indiana University—Bloomington, IN**
Ph.D. Instructional Systems Technology
Minor: Informatics, Human-Computer Interaction design

May 2010 — **University of South Carolina—Columbia, SC**
M.Ed. Educational Technology

Jun 2008 — **Savannah College of Art and Design—Savannah, GA**
M.A. Graphic Design

May 2005 — **Bob Jones University—Greenville, SC**
B.S. Graphic Design

Professional Experience

2012—2014 — **Graduate Assistant, Indiana University**
Research assistant for Elizabeth Boling
Assistant Editor of the International Journal of Designs for Learning

1998—present — **Principal, graydesign**
Web design & development; Custom theme development
Branding and visual strategy; print & interactive development
Interaction design and instructional strategy

2011—2012 — **Graduate Assistant, Indiana University**
Support distance adjunct instructors in Instructional Systems Technology
Manage updates and news on the department web site

2007—2010 — **Art Director, Think Up Consulting**
Art direction of all organizational activities; oversight of graphic production
Visual integration of instructional design, development, and implementation processes
Management of a team of desktop publishers and graphic designers
Creation and sustainment of an internship program

Teaching

2009—2014 — **Facilitator, Apollo Group—Phoenix, AZ**
WEB404: Web Design & Development I (5 sections)
WEB435: Web Commercialization II (21 sections)

2011-2012 **Volunteer Associate Instructor/Mentor**
INFO-I541: Interaction Design Practice (2 sections)
EDUC-R341: Multimedia in Instructional Technology (1 section)
Indiana University—Bloomington, IN

Journal Publications

Peer Reviewed

Boling, E., Gray, C. M., Modell, M. G., Altuwaijri, A., & Jung, J. (in press). Learners Interpreting Instructional Images: Meaning-making and decision-making strategies. *Journal of Visual Literacy, 33*(2).

Gray, C. M. & Howard, C. D. (in press). Designerly Talk in Non-Pedagogical Social Spaces. *Journal of Learning Design, 7*(1).

Gray, C. M. (2013). Factors That Shape Design Thinking. *Design and Technology Education, 18*(3), 8-20.

Gray, C. M., Jung, J., Watson, C., Jia, X., & Frick, T. W. (2012). Models and Design Judgment: Conflicting Perspectives on Redesigning a Doctoral Readings Course. *International Journal of Designs for Learning 3*(1), 27-38.

Modell, M. G., Gray, C. M. (2011). Searching for Personal Territory in a Human-Computer Interaction Design Studio. *Journal for Education in the Built Environment 6*(2), 54-78.

Juried

Gray, C. M. (in press). Informal Peer Critique and the Negotiation of Habitus in a Design Studio. *Art, Design and Communication in Higher Education* special issue from DRS // Cumulus 2013.

Gray, C. M. & Siegel, M. A. (in press). Sketching Design Thinking: Representations of Design in Education and Practice. *Design and Technology Education* special issue from DRS // Cumulus 2013.

Conference Proceedings

Peer Reviewed

Gray, C. M., Stolterman, E., & Siegel, M. A. (in press). Reprioritizing the Relationship Between HCI Research and Practice: Bubble-Up and Trickle-Down Effects. In *DIS'14: Proceedings of the 2014 CHI Conference on Designing Interactive Systems*. New York, NY: ACM Press. (Awarded Best Paper, top 1%).

Gray, C. M. (in press). Locating the Emerging Design Identity of Students Through Visual and Textual Reflection. In *Proceedings of the Design Research Society.* Umeå, Sweden.

Gray, C. M. (2014, April). Evolution of Design Competence in UX Practice. In *CHI'14: Proceedings of the 2014 CHI Conference on Human Factors in Computing Systems* (pp. 1645-1654). New York, NY: ACM Press. http://dx.doi.org/10.1145/2556288.2557264

Gray, C. M. (2013, November). Emergent Critique in Informal Design Talk: Reflections of Pedagogical and Epistemological Features in an HCI Studio. *Critique 2013: An International Conference Reflecting On Creative Practice in Art, Architecture, and Design*, Adelaide, South Australia, 341-355.

Gray, C. M. & Howard, C. D. (2013, November). Expectations of Reciprocity? An Analysis of Critique in Facebook Posts by Student Designers. *Critique 2013: An International Conference Reflecting On Creative Practice in Art, Architecture, and Design*, Adelaide, South Australia, 381-395.

Gray, C. M. (2013). Discursive Structures of Informal Critique in an HCI Design Studio. *Nordes 2013: Experiments in Design Research*, Copenhagen, Denmark/Malmö, Sweden, 110-118.

Gray, C. M. (2013). Informal Peer Critique and the Negotiation of Habitus in a Design Studio. *DRS // CUMULUS 2013: 2nd International Conference for Design Education Researchers*, Oslo, Norway, 702-714.

Gray, C. M. & Siegel, M. A. (2013). Sketching Design Thinking: Representations of Design in Education and Practice. *DRS // CUMULUS 2013: 2nd International Conference for Design Education Researchers*, Oslo, Norway, 2007-2031.

Juried

Gray, C. M., Jia, X., Watson, C., Wang, Y., Jung, J., & Frick, T. W. (2011). Frameworks for Facilitating Research Thinking: Redesigning a Residential Course for Online Use in Higher Education. *Association for Educational Communications and Technology Conference Proceedings*, Jacksonville, Florida.

Refereed Presentations & Workshops

Gray, C. M. (April 2014). Accounting for Learner Agency in an Aesthetic Learning Experience. Research Study Session at IST Conference 2014, Bloomington, IN.

Harris, M., Gray, C. M., Boling, E., Dagli, C., Demiral-Uzan, M., Ergulec, F., Gyabak, K., Kizilboga, R., Tan, V., & Tomita, K. (April 2014). Design Judgments in Instructional Design Practice. Research Study Session at IST Conference 2014, Bloomington, IN.

Boling, E., Gray, C. M., & Tan, V. (April 2014). Instructional Design In Action: Observing the Judgments of ID Practitioners. Paper Session at AERA Annual Meeting 2014, Philadelphia, PA.

Gray, C. M. & Howard, C. D. (November 2013). Expectations of Reciprocity? An Analysis of Critique in Facebook Posts by Student Designers. Critique 2013: An International Conference Reflecting On Creative Practice in Art, Architecture, and Design, Adelaide, South Australia.

Gray, C. M. (November 2013). Emergent Critique in Informal Design Talk: Reflections of Pedagogical and Epistemological Features in an HCI Studio. Critique 2013: An International Conference Reflecting On Creative Practice in Art, Architecture, and Design, Adelaide, South Australia.

Gray, C. M. (November 2013). Informal Peer Critique and the Negotiation of Habitus in a Design Studio. Concurrent Session as part of the ECT Foundation Qualitative Inquiry Award at AECT International Convention 2013, Anaheim, CA.

Gray, C. M. (November 2013). The Hidden Curriculum of the Design Studio: Student Engagement in Informal Critique. Concurrent Session at *AECT International Convention 2013*, Anaheim, CA.

Gray, C. M. (November 2013). Classroom Reflection as a Tool to Externalize Conceptions of Design. Poster Session at *AECT International Convention 2013*, Anaheim, CA.

Boling, E., Gray, C. M., & Howard, C. D. (October 2013). Design Case Workshop: International Journal of Designs for Learning. AECT International Convention 2013, Anaheim, CA.

Gray, C. M. (March 2013). Informal Peer Critique and the Negotiation of Habitus in a Design Studio. Indiana University Bloomington. Research Paper Session at IST Conference 2013, Bloomington, IN.

Gray, C. M. & Siegel, M. A. (March 2013). Sketching Design Thinking: Representations of Design in Education and Practice. Indiana University Bloomington. Research Paper Session at IST Conference 2013, Bloomington, IN.

Boling, E., Altuwaijri, A., Jung, J., Gray, C. M., Yildirim, C., Modell, M. G., Howard, C., Ergulec, F., & Demiral, M. (November 2012). Learners' Strategies for Interpreting Instructional Images. Concurrent Session at AECT International Convention 2012, Louisville, KY.

Boling, E., Smith, K. M., Howard, C., & Gray, C. (November 2012). Prospective Authors' Workshop: Design Cases and the International Journal of Designs for Learning. AECT International Convention 2012, Louisville, KY.

Gray, C. M. (November 2012). Design Thinking in a Graduate Design Studio: Personal and Pedagogical Factors. Concurrent Session at AECT International Convention 2012, Louisville, KY.

Gray, C. M. (November 2012). Verbalization of Design Thinking through Informal Peer Critique. Concurrent Session at AECT International Convention 2012, Louisville, KY.

Boling, E., Altuwaijri, A., Jung, J., Yildirim, C., Gray, C., Modell, M., & Howard, C. (March 2012). Strategies for Interpreting Instructional Images Used to Support Language Learning. Indiana University Bloomington. Research Paper Session at IST Conference 2012, Bloomington, IN.

Gray, C. M. (March 2012). The Role of Personal and Pedagogical Factors in Graduate Design Education. Indiana University Bloomington. Research Paper Session at IST Conference 2012, Bloomington, IN.

Jung, J., Gray, C., Howard, C., Kwon, S., Modell, M., & Boling, E. (November 2011). Preparation of Visual Materials to Study How EFL Learners Use Images in the Learning Process. Roundtable Discussion at AECT International Convention 2011, Jacksonville, FL.

Watson, C., Gray, C., Jia, K., Jung, J., & Wang, Y. (November 2011). A Case Study in Designing Online Instruction Using van Merriënboer's Ten Steps to Complex Learning. Concurrent Session at AECT International Convention 2011, Jacksonville, FL.

Altinay, B., Altuwaijri, A., Callison, M., Gray, C., Jung, E., Jung, J., & Yildirim, C. (February 2011). A Needs Assessment of Distance Education in the School of Education at Indiana University Bloomington. Poster Session at IST Conference 2011, Bloomington, IN.

Boling, E., Howard, C., Altuwaijri, A., Caldwell, K., Gray, C., Jung, J., Kwon, S., Modell, M., Whiting, J., Wu, T., & Yildirim, C. (February 2011). Visuals for Learning. Roundtable Discussion at IST Conference 2011, Bloomington, IN.

Watson, C., Gray, C., Jia, K., Jung, J., Wang, Y., & Frick, T. (February 2011). A Case Study in Designing Online Instruction using van Merriënboer's 4C/ID model. Roundtable Discussion at IST Conference 2011, Bloomington, IN.

Gray, C. M. (2009). Rapid e-learning: How do we get from here to there? Upstate Technology Conference 2010, Greenville, SC.

Invited Talks

2014, January 30. Developing a Designerly Identity: Implications for Design Education and Practice. Invited Address, University of Minnesota, Minneapolis, MN.

2013, November 13. Guest Lecturer, INFO-I542, Foundations of Human-Computer Interaction. Visual Aesthetics and Psychological Approaches to HCI.

2012, November 28. Student Workshop, Graduates in Instructional Systems Technology (GIST) Professional Development Series. Dossier Development Workshop.

2012, October 10. Connecting Research and Practice in Human-Computer Interaction. Discussion with practitioner Christian Beck.

2012, February 9. Guest Lecturer, R341: Multimedia in Instructional Technology. Using Adobe Photoshop for Web Production.

2011, February 8. Guest Lecturer, R341: Multimedia in Instructional Technology. Strategies for Visual Integration on the Web.

Professional Service

Leadership & Committees

2013-2014. Design & Development Board Associate, Association for Educational Communications and Technology (AECT).

2013-2014. Research, Development, External Partnerships Committee. Indiana University School of Education.

2013-2014. Departmental Representative, Graduate and Professional Student Organization (GPSO), Indiana University.

2012-2014. President/Past-President, Graduates in Instructional Systems Technology (GIST).

2014. Selection Committee Chair, IST Conference, Indiana University.

2012-2013. Graduate Student Assembly (GSA) Design & Development Board Representative, Association for Educational Communications and Technology (AECT).

2012-2013. Faculty Search Committee: Instructional Systems Technology, Indiana University.

Reviewing

2011-present. Reviewer for the International Journal of Designs for Learning.

2013-2014. Reviewer for ACM SIGCHI: CHI, DIS.

2012-2014. Reviewer for AECT International Convention, Design & Development Division.

2012-2014. Reviewer for IST Conference.

2013. Reviewer for AERA Annual Meeting.

2013. Journal of Learning Design.

2013. Reviewer for Nordes Conference.

2013. Journal of Online Learning and Teaching

Design & Development

2013. Graphic Designer, AECT Design & Development Division Logo.

2011, 2012. Graphic Designer, IST Conference, Indiana University.

2011. Graphic Designer, AECT Graduate Student Assembly Logo.

2010. Web and Graphic Designer, Redesign of Indiana University EDUC-F401 homepage and promotional materials.

Community Service

2012-present. Board Member, BJUnity, a group that promotes advocacy and support for LGBT individuals.

2010. Martin Luther King Design Competition Judge, Indiana University.

Professional Affiliations

Association for Computing Machinery (ACM)

Association for Educational Communications and Technology (AECT)

American Educational Research Association (AERA)

Design Research Society (DRS)

Awards

Best Paper Award, ACM SIGCHI Conference on Designing Interactive Systems, 2014.

ECT Foundation Qualitative Inquiry Award, 2013.

NSF Early Career Symposium Attendee, AECT International Convention, 2013.

Jerrold E. Kemp Instructional Systems Technology Fellowship, Indiana University, 2013.

L. C. Larson Award Recipient, Indiana University, 2013.

Best Research Paper Award, Instructional Systems Technology 13th Annual Conference, Indiana University, 2013.

Presidential Service Award, Design & Development Division, AECT, 2012.

Proffitt Doctoral Fellowship, Indiana University, 2010-2011.

Combined Honors Fellowship, Savannah College of Art and Design, 2005-2006.